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Space Station Integrated
Propulsion and Fluid Systems Study


Space Station Program
Fluid Systems
Hardware Catalog

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List of Acronyms

ECLSS	Environmental Control and Life Support System
ECLSS, ACS	Atmosphere Control and Supply Subsystem
ECLSS, AR	Atmospheric Revitalization Subsystem
ECLSS, FDS	Fire Detection and Suppression Subsystem
ECLSS, THC	Temperature and Humidity Control Subsystem
ECLSS, WM	Waste Management Subsystem
ECLSS, WRM	Water Recovery and Management Subsystem
JEM	Japanese Experimental Module
JEM, ELM	Experiment Logistics Module
TCS	Thermal Control System
INS	Integrated Nitrogen System
INS, DS	Distribution Subsystem
INS, RS	Resupply Subsystem
INS, SS	Storage Subsystem
IWFS	Integrated Waste Fluids System
IWS	Integrated Water System
SFHe	Super Fluid Helium
SFHT	Super Fluid Helium Tanker
USL	United States Laboratory
USL, PFS	Process Fluids Storage Subsystem
USL, PMMS	Process Materials Management Subsystem
USL, PWH	Process Waste Handling Subsystem
USL, VVS	Vacuum Vent Subsystem

1.0 INTRODUCTION

This Databook addresses the integration of fluid systems of the Space Station program. It includes a catalog of components required for the Space Station elements fluid systems information on potential hardware commonality.

The catalog of components consists of four major parts. The first part lists the components defined for all of the fluid systems identified in EP 2.1, Space Station Program Fluid Systems Configuration Databook. The components are cross-referenced in three sections of this databook. Section 2.1 lists the components by the fluid system they are used in. Section 2.2 lists the components by component type. Section 2.3 lists by the type of fluid/media that is handled by the component.

The next part of the component catalog provides a detailed description of the individual component. This section (2.4) is made up of data retrieved from Martin Marietta Denver Aerospace component data base.

The third part of the component catalog is an assessment of propulsion hardware technology requirements. Section 2.5 lists components that were identified during the study as requiring development prior to flight qualification.

Finally, Section 2.6 presents the results of the evaluation of commonality between components. The specific requirements of each component has been reviewed and all cases where a single component could meet multiple requirements are listed.

2.0 FLUID SYSTEMS HARDWARE CATALOGUE

The hardware catalog is a compilation of all the hardware items making up the systems which are described in detail in EP 2.1 Space Station Program Fluid Systems Configuration Databook. This catalog is organized into listings as follows:

- Section 2.1 Components Listed by Fluid System
- Section 2.2 Components Listed by Component Type
- Section 2.3 Components Listed by Fluid/Media Usage
- Section 2.4 Data Sheets by Individual Component
- Section 2.5 Technology Assessment
- Section 2.6 Commonality Assessment

The variables are defined as follows: each component has an item number assigned to it with a type and subtype which describe it. Where a common hardware usage is possible, more than one item number will be listed per component sheet number. The media listed is the media which is of the most concern with regard to material compatibility, for example, if a service valve for pressurant gases is also exposed to oxidizers then the fluid usage would call for oxidizers, not GHe. The maximum expected operating pressure and port size are dictated by design, while mass is either an estimate where no specific vendor part is identified, or is an actual weight where the specific vendor part can be identified. Vendor names and part numbers are identified where the design calls for a specific piece of hardware or was assigned a part number because of a best fit with the Martin Marietta propulsion component database.

2.1 FLUID SYSTEMS COMPONENT LISTINGS BY SYSTEM

The component lists in this section, Tables 2.1-1 through 2.1-6 list the component requirements of each of the Space Station Fluid Systems. These include the following elements:

- 1) ECLSS
- 2) INS
- 3) IWFS
- 4) IWS
- 5) SFHT
- 6) USL

TABLE 2.1-1 FLUID SYSTEM COMPONENT LIST - ECLSS

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (in)	PRESSURE (PSI)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
115	ECLSS, ACS	MISC, CONTROL, H2 RESUPPLY PRESSURE	1	TBD	TBD	GN2	57.0	TBD	TBD
114	ECLSS, ACS	PRESSURE VESSEL	2	TBD	TBD	LN2	170.0	TBD	TBD
113	ECLSS, ACS	MISC, REFRIGERATION/FREEZER	3	TBD	TBD	TBD	586.0	TBD	TBD
88	ECLSS, ACS	VALVE, RELIEF	5	.25	14.9	AIR	1.0	TBD	TBD
89	ECLSS, ACS	MISC, PRESSURE CONTROL SYSTEM	5	.375	25.0	CO2, GN2	50.0	TBD	TBD
90	ECLSS, ACS	VALVE, EQUALIZATION	9	TBD	14.9	AIR	6.0	TBD	TBD
87	ECLSS, ACS	REGULATOR, DOWNSTREAM	2	.375	750/30	GN2	1.0	TBD	TBD
93	ECLSS, AR	MISC, SORBENT BED	4	TBD	30	AIR	90.0	TBD	TBD
92	ECLSS, AR	FILTER, AVIONICS PARTICULATE	4	TBD	14.9	AIR	17.0	TBD	TBD
91	ECLSS, AR	MISC, ELECTROLYSIS UNIT, ROH	4	TBD	200	H2O, CO2, GN2	232.0	TBD	TBD
96	ECLSS, AR	MISC, MOLECULAR SIEVE, 4-BED	4	TBD	30	AIR, CO2	322.0	TBD	TBD
94	ECLSS, AR	MISC, CO2 REDUCTION, BOSCH	4	.25	30	AIR	328.0	TBD	TBD
99	ECLSS, AR	MISC, CATALYTIC OXIDIZER	4	TBD	30	AIR	80.0	TBD	TBD
95	ECLSS, AR	FILTER, BACTERIA/PARTICULATE	7	TBD	14.9	AIR	60.0	TBD	TBD
98	ECLSS, AR	MISC, MONITOR, ATMOSPHERE	5	TBD	14.9	AIR	57.0	TBD	TBD
101	ECLSS, FDS	MISC, CONTROLLER, FTHO	7	N/A	500	HALON 1301	2.0	TBD	TBD
100	ECLSS, FDS	PRESSURE VESSEL, FIRE SUPPRESSANT	76	TBD	500	HALON 1301	8.0	TBD	TBD
91	ECLSS, TTC	MISC, CABIN COOLING PKG	7	TBD	14.9	AIR	123.0	TBD	TBD
116	ECLSS, MN	MISC, BRINE STORAGE	6	TBD	TBD	URINE BRINE	33.0	TBD	TBD
117	ECLSS, MN	MISC, FECAL STORAGE	1	TBD	TBD	FECES	52.0	TBD	TBD
104	ECLSS, MMH	PRESSURE VESSEL, EMERGENCY WASH WATER	2	TBD	44.9	H2O	128.0	TBD	TBD
107	ECLSS, MMH	MISC, PROCESSING UNIT, WASTE HYGIENE	2	TBD	44.9	H2O	202.0	TBD	TBD
111	ECLSS, MMH	PRESSURE VESSEL, WASTE HYGIENE WATER	2	TBD	44.9	H2O	292.5	TBD	TBD
110	ECLSS, MMH	PRESSURE VESSEL, PROCESSED HYGIENE WATER	2	TBD	44.9	H2O	315.0	TBD	TBD
108	ECLSS, MMH	MISC, PROCESSING UNIT, POTABLE WATER	4	TBD	44.9	H2O	77.0	TBD	TBD
105	ECLSS, MMH	PRESSURE VESSEL, CONDENSATE WATER	2	TBD	44.9	H2O	108.0	TBD	TBD
102	ECLSS, MMH	PRESSURE VESSEL, POTABLE WATER	4	TBD	44.9	H2O	166.0	TBD	TBD
109	ECLSS, MMH	MISC, EYEWASH	1	TBD	44.9	H2O	1.0	TBD	TBD
112	ECLSS, MMH	PRESSURE VESSEL, HYGIENE WATER	1	TBD	44.9	H2O	1000.0	TBD	TBD
103	ECLSS, MMH	MISC, DISPENSER, POTABLE WATER	2	TBD	44.9	H2O	41.0	TBD	TBD
106	ECLSS, MMH	MISC, MONITOR, WATER QUALITY	8	TBD	44.9	H2O	68.0	TBD	TBD

TABLE 2.1-2 FLUID SYSTEM COMPONENT LIST - INS

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (in)	PRESSURE (PSI)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
143	INS, DS	REGULATOR, ELECTRONIC, W/RELIEF	2	.375	4000/750	GN2	4.0	TBD	TBD
144	INS, DS	SENSOR, PRESSURE	2	.25	4000	GN2	0.6	EATON CONSOLIDATED CONTROLS CORP.	41SC197-2000A1 MOD
145	INS, DS	SENSOR, PRESSURE	2	.25	750	GN2	0.4	IMO DELAVAL INC., CEC INSTR. DIV.	615505 MODIFIED
146	INS, DS	SENSOR, TEMPERATURE	2	.25	750	GN2	0.1	TBD	TBD
147	INS, DS	DISCONNECT	4	TBD	4000	GN2	TBD	TBD	TBD
148	INS, DS	FILTER, INLINE	4	TBD	4000	GN2	TBD	TBD	TBD
149	INS, DS	VALVE, SOLENOID, LATCHING	3	TBD	750	GN2	TBD	TBD	TBD
139	INS, DS	VALVE, SOLENOID, LATCHING	3	.25	4000	GN2	1.6	TBD	TBD
138	INS, DS	VALVE, TORQUE MOTOR	12	.25	750	GN2	1.6	TBD	TBD
137	INS, DS	VALVE, TORQUE MOTOR	4	.25	4000	GN2	1.6	TBD	TBD
119	INS, AS	VALVE, MANUAL, SERVICE	2	.5	4000	GN2	2.0	VACO INDUSTRIES	VIE10330 01
127	INS, AS	SENSOR, TEMPERATURE	12	.25	4000	GN2	0.2	TBD	TBD
126	INS, AS	SENSOR, PRESSURE	16	.25	4000	GN2	0.6	EATON CONSOLIDATED CONTROLS CORP.	41SC197-2000A1 MOD
125	INS, AS	DISCONNECT	4	TBD	4000	GN2	TBD	TBD	TBD
124	INS, AS	FILTER, INLINE	4	TBD	4000	GN2	TBD	TBD	TBD
123	INS, AS	MISC, VENT ASSY, NON-PROPULSIVE	12	TBD	4000	GN2	TBD	TBD	TBD
122	INS, AS	VALVE, RELIEF W/RO	17	.75	1000	GN2	1.6	TBD	TBD
118	INS, AS	PRESSURE VESSEL	12	TBD	4000	GN2	TBD	TBD	TBD
121	INS, AS	VALVE, TORQUE MOTOR	4	.25	4000	GN2	1.6	TBD	TBD
120	INS, AS	VALVE, SOLENOID, LATCHING	24	.25	4000	GN2	1.6	TBD	TBD
136	INS, SS	SENSOR, TEMPERATURE	6	.25	4000	GN2	0.2	TBD	TBD
135	INS, SS	SENSOR, PRESSURE	10	.25	4000	GN2	0.6	EATON CONSOLIDATED CONTROLS CORP.	41SC197-2000A1 MOD
134	INS, SS	DISCONNECT	8	TBD	4000	GN2	TBD	TBD	TBD
133	INS, SS	FILTER, INLINE	8	TBD	4000	GN2	TBD	TBD	TBD
132	INS, SS	MISC, VENT ASSY, NON-PROPULSIVE	6	TBD	4000	GN2	TBD	TBD	TBD
131	INS, SS	VALVE, RELIEF W/RO	6	.25	4000	GN2	TBD	TBD	TBD
128	INS, SS	PRESSURE VESSEL	6	TBD	4000	GN2	TBD	TBD	TBD
129	INS, SS	VALVE, SOLENOID, LATCHING	12	.25	4000	GN2	1.6	TBD	TBD
130	INS, SS	VALVE, TORQUE MOTOR	8	.25	4000	GN2	1.6	TBD	TBD

TABLE 2.1-3 FLUID SYSTEM COMPONENT LIST - IWFS

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (In)	PRESSURE RDP (psia)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
180	INFS,	VALVE, ELECTRIC	24	.25	30	H2O	1.4	WRIGHT COMPONENTS INC.	15613
184	INFS,	FILTER, INLINE	4	.5	300	ALL	0.5	TBD	TBD
185	INFS,	DISCONNECT,	16	.375	15	OXIDIZERS	0.4	SYNTRICS INC.	592002-3 & -4
201	INFS,	PRESSURE VESSEL,	2	.5	300	OXIDIZERS	101.8	TBD	TBD
202	INFS,	PRESSURE VESSEL,	4	.25	300	REDUCERS	101.8	TBD	TBD
203	INFS,	PRESSURE VESSEL,	1	.25	30	H2O	42.0	TBD	TBD
204	INFS,	PRESSURE VESSEL, ACCUMULATORS	2	.25/.5	35	REDUCERS	8.3	TBD	TBD
205	INFS,	PRESSURE VESSEL, ACCUMULATORS	1	.25	TBD	H2O	3.2	TBD	TBD
206	INFS,	MISC, COMPRESSOR	2	.5	300	OXIDIZERS	30.0	TBD	TBD
207	INFS,	MISC, COMPRESSOR	2	.25	300	REDUCERS	30.0	TBD	TBD
208	INFS,	MISC, PUMP	2	TBD	TBD	H2O	35.0	TBD	TBD
178	INFS,	VALVE, ELECTRIC	2	.25	800	GN2	1.5	TBD	TBD
178	INFS,	VALVE, ELECTRIC	6	.25	30	GN2	0.5	WRIGHT COMPONENTS INC.	15611-2
177	INFS,	VALVE, ELECTRIC	2	.25	180	REDUCERS	0.5	MOOG, SPACE PRODUCTS DIVISION	53-159
176	INFS,	VALVE, ELECTRIC	40	.25	15.0	REDUCERS	1.5	WRIGHT COMPONENTS INC.	15983-1
190	INFS,	REGULATOR, DOWNSTREAM	2	.25	300/75	OXIDIZERS	0.3	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
181	INFS,	VALVE, ELECTRIC	8	.5	15	ALL	1.5	WRIGHT COMPONENTS INC.	15975
175	INFS,	VALVE, ELECTRIC	34	.375	15	OXIDIZERS	0.6	WRIGHT COMPONENTS INC.	15751
182	INFS,	VALVE, RELIEF	2	.5	300	OXIDIZERS	2.0	TBD	TBD
183	INFS,	VALVE, RELIEF	6	.25	300	REDUCERS	2.0	TBD	TBD
185	INFS,	VALVE, RELIEF	1	.25	30	H2O	1.0	TBD	TBD
186	INFS,	VALVE, CHECK	12	.5	300	OXIDIZERS	0.2	PAROTTA SCIENTIFIC CONTROLS	806232
187	INFS,	VALVE, CHECK	14	.25	300	REDUCERS	0.5	VACCO INDUSTRIES	4573779
188	INFS,	VALVE, CHECK	8	.25	30	H2O	0.5	VACCO INDUSTRIES	VID10746-01
189	INFS,	REGULATOR, DOWNSTREAM	2	.25	300/75	REDUCERS	0.3	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
191	INFS,	REGULATOR, DOWNSTREAM	6	.25	750/30	GN2	0.6	MEADWYNE CONTROLS CORP.	3066-5-000 MODIFIED
192	INFS,	SENSOR, PRESSURE	42	.25	300	ME/COX/INERTS	0.5	TELEDYNE TAPER	2403-200
561	INFS,	PRESSURE VESSEL, ACCUMULATORS	2	.25/.5	35	OXIDIZERS	8.3	TBD	TBD
193	INFS,	SENSOR, PRESSURE	14	.25	30	H2O	0.5	MOOG, CALLETON GROUP	2731-0001-5
198	INFS, ATT PAYLOADS	DISCONNECT,	2	.25	800	REDUCERS	0.8	SYNTRICS INC.	502040-1011 & -301
197	INFS, ECLSS	DISCONNECT,	2	.25	180	REDUCERS	0.8	SYNTRICS INC.	502040-1011 & -301
200	INFS, INS	DISCONNECT,	4	.25	750	GN2	0.8	SYNTRICS INC.	502040-1011 & -301
199	INFS, INS	DISCONNECT,	16	.25	30	H2O	0.8	SYNTRICS INC.	502040-1011 & -301
196	INFS, LABS	DISCONNECT,	12	.25	15	REDUCERS	0.8	SYNTRICS INC.	502040-1011 & -301

TABLE 2.1-4 FLUID SYSTEM COMPONENT LIST - IWS

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (in)	PRESSURE RDP (psia)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
209	INS.	VALVE, ELECTRIC	88	TBD	30	H2O	3.0	TBD	TBD
210	INS.	VALVE, RELIEF	8	.25	30	H2O	1.0	TBD	TBD
211	INS.	VALVE, CHECK	6	.25	30	H2O	0.5	VACCO INDUSTRIES	VID10716-01
212	INS.	REGULATOR, DOWNSTREAM	4	.25	750/30	GM2	0.6	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED
213	INS.	SENSOR, PRESSURE	28	.25	30	H2O	0.5	MOOG, CARLETON GROUP	2731-0001-5
214	INS.	SENSOR, TEMPERATURE	28	.25	30	H2O	0.1	TBD	TBD
215	INS.	FILTER, INLINE	TBD	TBD	30	H2O	1.0	TBD	TBD
216	INS.	HEAT, HEATER	305	N/A	N/A	H2O	0.5	TBD	TBD
217	INS.	DISCONNECT	4	TBD	30	H2O	TBD	TBD	TBD
218	INS.	PRESSURE VESSEL	6	TBD	30	H2O	76.0	TBD	TBD

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TABLE 2.1-5 FLUID SYSTEM COMPONENT LIST - SFHT

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (in)	PRESSURE MDOP (psia)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
174	SEHT.	SENSOR, FLOW METER, GAS	1	.375	VACUUM	SFHE	1.0	TBD	TBD
173	SEHT.	SENSOR, FLOW METER, LIQUID	2	1.0	VACUUM	SFHE	1.0	TBD	TBD
172	SEHT.	SENSOR, MASS METER	1	TBD	VACUUM	SFHE	0.1	TBD	TBD
171	SEHT.	SENSOR, TEMPERATURE	15	.25	VACUUM	SFHE	0.2	TBD	TBD
147	SEHT.	PRESSURE VESSEL, ISOBID	1	MULTIPLE	VACUUM	SFHE	750.0	TBD	TBD
148	SEHT.	PRESSURE VESSEL, STIFFENED MONOCOQUE DISCONNECT.	1	MULTIPLE	VACUUM	SFHE	1500.0	TBD	TBD
149	SEHT.	DISCONNECT.	2	1.0	VACUUM	SFHE	2.0	TBD	TBD
150	SEHT.	DISCONNECT, EMERGENCY	2	1.0	VACUUM	SFHE	3.0	TBD	TBD
151	SEHT.	MISC, FLEX HOSE	2	1.0	VACUUM	SFHE	8.0	TBD	TBD
152	SEHT.	VALVE, SOLENOID, LATCHING W/MR	6	.375	VACUUM	SFHE	1.5	TBD	TBD
153	SEHT.	VALVE, SOLENOID, LATCHING W/MR	22	1.0	VACUUM	SFHE	4.0	TBD	TBD
154	SEHT.	VALVE, SOLENOID, LATCHING	4	1.0	VACUUM	SFHE	3.0	TBD	TBD
155	SEHT.	VALVE, MANUAL, SHUT-OFF	1	1.0	VACUUM	SFHE	1.0	TBD	TBD
169	SEHT.	MISC, HEAT EXCHANGER	1	MULTIPLE	VACUUM	SFHE	3.0	TBD	TBD
148	SEHT.	MISC, POROUS PLUG	1	1.0	VACUUM	SFHE	1.2	TBD	TBD
167	SEHT.	MISC, POROUS PLUG	1	.375	VACUUM	SFHE	0.3	TBD	TBD
166	SEHT.	MISC, PUMP, VACUUM GAGE ION	1	.5	VACUUM	SFHE	3.0	TBD	TBD
165	SEHT.	MISC, PUMP, VACUUM	1	.375	VACUUM	SFHE	8.0	TBD	TBD
144	SEHT.	MISC, PUMP, FEP	2	1.0	VACUUM	SFHE	0.8	TBD	TBD
163	SEHT.	MISC, VENT ASSY, NON-PROPULSIVE	1	MULTIPLE	VACUUM	SFHE	0.5	TBD	TBD
162	SEHT.	MISC, VENT ASSY, NON-PROPULSIVE	1	.375	VACUUM	SFHE	0.3	TBD	TBD
161	SEHT.	MISC, VENT ASSY, NON-PROPULSIVE	1	1.0	VACUUM	SFHE	0.3	TBD	TBD
160	SEHT.	MISC, BURST DISK	2	1.0	VACUUM	SFHE	0.9	TBD	TBD
159	SEHT.	VALVE, RELIEF	1	1.0	VACUUM	SFHE	2.0	TBD	TBD
158	SEHT.	VALVE, RELIEF	2	1.0	VACUUM	SFHE	3.0	TBD	TBD
157	SEHT.	VALVE, SEAL-OFF, VACUUM	4	0.5	VACUUM	SFHE	0.5	TBD	TBD
156	SEHT.	VALVE, SEAL-OFF, VACUUM	1	1.0	VACUUM	SFHE	1.0	TBD	TBD
170	SEHT.	SENSOR, PRESSURE	5	.25	VACUUM	SFHE	0.8	TBD	TBD

TABLE 2.1-6 FLUID SYSTEM COMPONENT LIST - USL

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY/NO	SIZE (in)	PRESSURE (PSI)	USAGE MEDIA	APPROX. WTS (lb)	VENDOR NAME	VENDOR PART NUMBER
35	USL, PFS	MISC. FLEX HOSE	40	.25	50	GHE, AR	0.2	TBD	TBD
16	USL, PFS	SENSOR, PRESSURE	2	.25	3000	GHE, AR	0.5	STATAM DIVISION, BOLANTON	C59284/A MODIFIED
17	USL, PFS	VALVE, CHECK	2	.375	100	H2O	0.9	TBD	TBD
18	USL, PFS	MISC. WATER PROCESSOR	1	.375	100	H2O	66.2	TBD	TBD
15	USL, PFS	PRESSURE VESSEL, PROCESS WATER	1	.375	100	H2O	1080.3	TBD	TBD
14	USL, PFS	FILTER, INLINE	1	.375	100	H2O	5.5	TBD	TBD
13	USL, PFS	SENSOR, FLOW METER	2	.375	100	H2O	2.0	TBD	TBD
12	USL, PFS	MISC. FLEX HOSE	1	.375	100	H2O	1.1	TBD	TBD
11	USL, PFS	DISCONNECT,	12	.25	3000	GHE, AR	0.6	PTI TECHNOLOGIES, INC.	7531191-4
10	USL, PFS	VALVE, CHECK	1	.25	3000	GHE, AR	0.7	CIRCLE SEAL CONTROLS	C27/A-40
9	USL, PFS	VALVE, ELECTRIC	12	.25	3000	GHE, AR	1.5	AMETEK, STRAZA DIVISION	435
8	USL, PFS	VALVE, FLOW RESTRICTOR	2	.375	3000	GHE, AR	0.2	TBD	TBD
7	USL, PFS	MISC. FLEX HOSE	1	.375	50	H2O	0.4	TBD	TBD
6	USL, PFS	SENSOR, TEMPERATURE	2	.25	3000	GHE, AR	0.2	TBD	TBD
34	USL, PFS	VALVE, ELECTRIC	36	.25	50	GHE, AR	0.5	WEIGHT COMPONENTS INC.	15611-2
33	USL, PFS	DISCONNECT,	36	.375	100	H2O	0.4	SYNTRICS INC.	592002-3 & -4
17	USL, PFS	VALVE, ELECTRIC	47	.375	100	H2O	1.7	MOOG, SPACE PRODUCTS DIVISION	52-178
30	USL, PFS	DISCONNECT,	44	.25	100	H2O	0.8	SYNTRICS INC.	502040-1011 & -301
29	USL, PFS	PRESSURE VESSEL, PORTABLE	18	.25	2000	ALL BUT H2O	12.5	TBD	TBD
28	USL, PFS	PRESSURE VESSEL,	6	.25	3000	AR	36.4	TBD	TBD
27	USL, PFS	PRESSURE VESSEL,	6	.25	3000	GHE	26.0	TBD	TBD
25	USL, PFS	SENSOR, QUALITY METER	1	.375	100	H2O	2.2	TBD	TBD
24	USL, PFS	REGULATOR, DOWNSTREAM	2	.25	3000/50	GHE, AR	1.8	FUTURECRAFT CORP.	400236 MODIFIED
23	USL, PFS	MISC. PUMP	1	.375	100	H2O	11.4	TBD	TBD
22	USL, PFS	SENSOR, DELTA PRESSURE	1	.375	100	H2O	0.5	TBD	TBD
21	USL, PFS	PRESSURE VESSEL, STORAGE CONT.	1	.375	50	H2O	15.4	TBD	TBD
20	USL, PFS	VALVE, FLOW RESTRICTOR	1	.375	100	H2O	0.3	TBD	TBD
19	USL, PFS	PRESSURE VESSEL,	1	.375	100	H2O	33.1	TBD	TBD
58	USL, PMH	DISCONNECT,	17	.375	14.7	ALL	0.4	SYNTRICS INC.	592002-3 & -4
59	USL, PMH	MISC. OXYO UNIT, LK2 PRODUCTION	1	.25	300	LH2	33.0	TBD	TBD
84	USL, PMH	MISC. FLEX HOSE, TEFLOW LINED	30	1.0	14.7	ALL	0.3	TBD	TBD
68	USL, PMH	SENSOR, QUALITY MONITOR	2	TBD	TBD	H2O	22.1	TBD	TBD
61	USL, PMH	MISC. TIMES UNIT	1	.375	100	H2O	95.0	HAMILTON STANDARD	TBD
62	USL, PMH	SENSOR, TEMPERATURE	1	.25	TBD	H2O	0.1	TBD	TBD
63	USL, PMH	VALVE, ELECTRIC	2	TBD	TBD	ALL	1.7	TBD	TBD
64	USL, PMH	DISCONNECT,	10	2.0	14.7	ALL	1.8	TBD	TBD
65	USL, PMH	PRESSURE VESSEL,	1	.375	TBD	BRINE	7.5	TBD	TBD
66	USL, PMH	SENSOR, PRESSURE	7	.25	TBD	ALL	0.7	TBD	TBD

TABLE 2.1-6 FLUID SYSTEM COMPONENT LIST - USL (CONTINUED)

ITEM	PROGRAM APPLICATION	COMPONENT TYPE	QTY REQD	SIZE (in)	PRESSURE HOOP (psi)	USAGE MEDIA	APPROX MASS (lb)	VENDOR NAME	VENDOR PART NUMBER
67	USL, PMH	MISC, COMPRESSOR, REFRIGERATION	1	.75	300	GHE	141.1	TBD	TBD
68	USL, PMH	PRESSURE VESSEL, WASTE HOLDING	1	2.0	TBD	ALL	15.0	TBD	TBD
69	USL, PMH	MISC, FLEX HOSE, TEFLOM LINED	12	2.0	100	ALL	1.9	TBD	TBD
70	USL, PMH	MISC, PUMP	2	2.0	14.7/100	ALL	22.9	TBD	TBD
71	USL, PMH	VALVE, CHECK	3	.375	TBD	ALL	0.9	TBD	TBD
72	USL, PMH	MISC, FLEX HOSE	4	.75	300	LHE	0.6	TBD	TBD
73	USL, PMH	FILTER, MULTIPLE	1	.375	100	H2O	48.5	TBD	TBD
74	USL, PMH	VALVE, VENT ASSY	2	2.0	TBD	ALL	3.9	TBD	TBD
75	USL, PMH	PRESSURE VESSEL, MATERIAL TRANS. CONT.	1	TBD	TBD	ALL	9.9	TBD	TBD
76	USL, PMH	PRESSURE VESSEL, UNIT, WASTE	2	2.0	100	ALL	10.0	TBD	TBD
77	USL, PMH	MISC, FLEX HOSE, TEFLOM LINED	28	1.0	14.7	ALL	0.5	TBD	TBD
78	USL, PMH	SENSOR, TEMPERATURE	14	.25	TBD	ALL	0.1	TBD	TBD
49	USL, PMH	MISC, FLEX HOSE, TEFLOM LINED	7	1.0	14.7	ALL	0.8	TBD	TBD
50	USL, PMH	PRESSURE VESSEL	7	2.0	TBD	ALL	14.0	TBD	TBD
51	USL, PMH	VALVE, RELIEF	5	.25	TBD	ALL	1.5	TBD	TBD
52	USL, PMH	DISCONNECT	7	.25	14.7	ALL	0.8	SYMETRICS INC.	502040-1011 & -301
48	USL, PMH	SENSOR, PRESSURE	65	.25	14.7	ALL	0.4	KULITE SIMICONDUCTOR PRODUCTS INC.	BMSE-1100-10
47	USL, PMH	MISC, SEPARATOR, GAS/LIQUID	7	TBD	TBD	ALL	12.0	TBD	TBD
45	USL, PMH	PRESSURE VESSEL, LIQUID WASTE	7	.25	TBD	ALL	5.0	TBD	TBD
44	USL, PMH	REGULATOR, DOWNSTREAM	14	1.0	3000/15	ALL	2.0	TBD	TBD
43	USL, PMH	PRESSURE VESSEL, WASTE CONTAINMENT	7	.25	TBD	ALL	18.0	TBD	TBD
42	USL, PMH	SENSOR, FLOW METER	14	TBD	14.7	ALL	0.8	TBD	TBD
41	USL, PMH	MISC, DIFFUSER, SUCTION	14	1.0	300	ALL	0.4	TBD	TBD
39	USL, PMH	FILTER, INLINE	13	TBD	TBD	ALL	1.0	TBD	TBD
38	USL, PMH	VALVE, ELECTRIC	50	1.0	3000	ALL	2.2	AMETEX, STRAZA DIVISION	525-503
37	USL, PMH	DISCONNECT	101	1.0	14.7	ALL	1.0	TBD	TBD
36	USL, PMH	VALVE, CHECK	8	.25	TBD	ALL	0.6	TBD	TBD
53	USL, PMH	VALVE, RELIEF	2	TBD	TBD	ALL	3.9	TBD	TBD
54	USL, PMH	ENGINE, BURNER, CATALYTIC	2	2.0	TBD	TBD	60.0	TBD	TBD
55	USL, PMH	PRESSURE VESSEL, WASTE GAS	2	2.0	TBD	ALL	703.4	TBD	TBD
57	USL, PMH	MISC, PUMP, VACUUM	3	2.0	.25 TORR/14.7	ALL	550.1	TBD	TBD
81	USL, PMH	MISC, VACUUM UNIT, PORTABLE	1	TBD	TBD	ALL	10.0	TBD	TBD
4	USL, VVS	VALVE, ELECTRIC	4	6.0	.25 (TORR)	ALL	15.0	TBD	TBD
1	USL, VVS	SENSOR, PRESSURE	2	.25	.25 (TORR)	ALL	1.9	TBD	TBD
5	USL, VVS	VALVE, MANUAL, SHUT-OFF	2	6.0	.25 (TORR)	ALL	0.7	TBD	TBD
2	USL, VVS	VALVE, MANUAL, SHUT-OFF	22	2.0	.25 (TORR)	ALL	1.4	TBD	TBD
3	USL, VVS	DISCONNECT	22	2.0	.25 (TORR)	ALL	1.8	TBD	TBD

2.2 FLUID SYSTEM HARDWARE LISTING BY COMPONENT TYPE

Tables 2.2-1 through 2.2-8 in this section list the components by component type.

TABLE 2.2-1 FLUID SYSTEM HARDWARE - DISCONNECTS

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE WOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
DISCONNECT		1	186	INFS , ATT PAYLOADS	REDUCERS	800	.25	0.8	2	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	187	INFS , CELLS	REDUCERS	180	.25	0.8	2	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	188	INFS , INFS	H2O	30	.25	0.8	16	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	189	INFS , LABS	REDUCERS	15	.25	0.8	12	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	190	USL , PFS	H2O	100	.25	0.8	44	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	200	INFS , INFS	CM2	750	.25	0.8	4	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		1	46	USL , PMH	ALL	14.7	.25	0.8	7	SYNETRIS INC.	502040-1011 4 -3012
DISCONNECT		2	11	USL , PFS	CM2 , AR	3000	.25	0.6	12	PTI TECHNOLOGIES, INC.	7537191-4
DISCONNECT		3	58	USL , PMH	ALL	14.7	.375	0.4	17	SYNETRIS INC.	592002-3 4 4
DISCONNECT		3	195	INFS ,	OXIDIZERS	15	.375	0.4	16	SYNETRIS INC.	592002-3 4 4
DISCONNECT		3	33	USL , PFS	H2O	100	.375	0.4	36	SYNETRIS INC.	592002-3 4 4
DISCONNECT		4	37	USL , PMH	ALL	14.7	1.0	1.0	101	TBD	TBD
DISCONNECT		5	149	STMT ,	SFHE	VACUUM	1.0	2.0	2	TBD	TBD
DISCONNECT		6	64	USL , PMH	ALL	14.7	2.0	1.8	10	TBD	TBD
DISCONNECT		6	3	USL , VVS	ALL	.25 (TUBA)	2.0	1.8	22	TBD	TBD
DISCONNECT		7	217	INFS ,	H2O	30	TBD	TBD	4	TBD	TBD
DISCONNECT		8	142	INFS , VS	CM2	4000	TBD	TBD	1	TBD	TBD
DISCONNECT		8	134	INFS , AS	CM2	4000	TBD	TBD	8	TBD	TBD
DISCONNECT		8	125	INFS , AS	CM2	4000	TBD	TBD	4	TBD	TBD
DISCONNECT	EMERGENCY	9	150	STMT ,	SFHE	VACUUM	1.0	3.0	2	TBD	TBD

TABLE 2.2-2 FLUID SYSTEM HARDWARE - ENGINES

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE WOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
ENGINE	BURNER, CATALYTIC	10	54	USL , PMH	TBD	TBD	2.0	60.0	2	TBD	TBD

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TABLE 2.2-3 FLUID SYSTEM HARDWARE - FILTERS

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE DROP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
FILTER	AVIONICS PARTICULATE	11	92	ECLSS, AR	AIR	14.9	TBD	17.0	4	TBD	TBD
FILTER	BACTERIA/PARTICULATE	12	95	ECLSS, AR	AIR	14.9	TBD	60.0	7	TBD	TBD
FILTER	INLINE	13	14	USL, PFN	H2O	100	.375	5.5	1	TBD	TBD
FILTER	INLINE	14	194	IMS, TMS	ALL	300	.5	0.5	4	TBD	TBD
FILTER	INLINE	15	215	IMS	H2O	30	TBD	1.0	TBD	TBD	TBD
FILTER	INLINE	16	141	IMS, OS	GM2	4000	TBD	TBD	4	TBD	TBD
FILTER	INLINE	16	133	IMS, SS	GM2	4000	TBD	TBD	8	TBD	TBD
FILTER	INLINE	16	124	IMS, RS	GM2	4000	TBD	TBD	4	TBD	TBD
FILTER	INLINE	17	99	USL, PMH	ALL	TBD	TBD	1.0	13	TBD	TBD
FILTER	MULTIPLE	18	73	USL, PMH	H2O	100	.375	48.5	1	TBD	TBD

TABLE 2.2-4 FLUID SYSTEM HARDWARE - MISCELLANEOUS

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MBOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
MISC	WASTE STORAGE	19	116	ECLESS ,NM	URINE BRINE	TBD	TBD	33.0	6	TBD	TBD
MISC	BURST DISK	20	160	SEHT ,	SEHE	VACUUM	1.0	0.9	2	TBD	TBD
MISC	CALIN COOLING PKG	21	91	ECLESS ,TIC	AIR	14.9	TBD	123.0	7	TBD	TBD
MISC	CATALYTIC OXIDIZER	22	99	ECLESS ,AR	AIR	30	TBD	80.0	4	TBD	TBD
MISC	CO2 REDUCTION, BOSCH	23	94	ECLESS ,AR	AIR	30	.25	328.0	4	TBD	TBD
MISC	COMPRESSOR	24	207	TMS ,	REDUCERS	300	.25	30.0	2	TBD	TBD
MISC	COMPRESSOR	25	206	TMS ,	OXIDIZERS	300	.5	30.0	2	TBD	TBD
MISC	COMPRESSOR, REFRIGERANTI	26	67	USL ,PMH	GHE	300	.75	141.1	1	TBD	TBD
MISC	CONTROL, W2 RESUPPLY PR	27	115	ECLESS ,ACS	GH2	TBD	TBD	57.0	1	TBD	TBD
MISC	CONTROLLER, PYRO	28	101	ECLESS ,FDS	HALON 1301	500	N/A	2.0	7	TBD	TBD
MISC	CRYO UNIT, L42 PRODUCTI	29	59	USL ,PMH	L42	300	.25	33.0	1	TBD	TBD
MISC	DIFFUSER, Suction	30	40	USL ,PMH	ALL	300	1.0	0.4	14	TBD	TBD
MISC	DISPENSER, POTABLE WATE	31	103	ECLESS ,NMH	H2O	44.9	TBD	41.0	2	TBD	TBD
MISC	ELECTROLYSIS UNIT, ROM	32	97	ECLESS ,AR	H2O, O2, GH2	200	TBD	232.0	4	TBD	TBD
MISC	EXTENSION	33	109	ECLESS ,NMH	H2O	44.9	TBD	1.0	1	TBD	TBD
MISC	FECAL STORAGE	34	117	ECLESS ,NM	FECES	TBD	TBD	52.0	1	TBD	TBD
MISC	FLEX ROSE	35	35	USL ,PFS	GHE, AR	50	.25	0.2	40	TBD	TBD
MISC	FLEX ROSE	36	7	USL ,PFS	H2O	50	.375	0.4	1	TBD	TBD
MISC	FLEX ROSE	37	12	USL ,PFS	H2O	100	.375	1.1	1	TBD	TBD
MISC	FLEX ROSE	38	72	USL ,PMH	LHE	300	.75	0.6	4	TBD	TBD
MISC	FLEX ROSE	39	151	SEHT ,	SEHE	VACUUM	1.0	8.0	2	TBD	TBD
MISC	FLEX ROSE, TEFLOW LINED	40	84	USL ,PMH	ALL	14.7	1.0	0.3	30	TBD	TBD
MISC	FLEX ROSE, TEFLOW LINED	41	78	USL ,PMH	ALL	14.7	1.0	0.5	28	TBD	TBD
MISC	FLEX ROSE, TEFLOW LINED	42	50	USL ,PMH	ALL	14.7	1.0	0.8	7	TBD	TBD
MISC	FLEX ROSE, TEFLOW LINED	43	69	USL ,PMH	ALL	100	2.0	1.9	12	TBD	TBD
MISC	HEAT EXCHANGER	44	169	SEHT ,	SEHE	VACUUM	MULTIPLE	3.0	1	TBD	TBD
MISC	HEATER	45	216	TMS ,	H2O	N/A	N/A	0.5	305	TBD	TBD
MISC	MOLECULAR SIEVE, 4-BED	46	96	ECLESS ,AR	AIR, CO2	30	TBD	322.0	4	TBD	TBD

TABLE 2.2-4 FLUID SYSTEM HARDWARE - MISCELLANEOUS (CONTINUED)

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MDOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
MISC	MONITOR, ATMOSPHERE	47	98	BCISS ,AR	AIR	14.9	TBD	57.0	5	TBD	TBD
MISC	MONITOR, WATER QUALITY	48	106	BCISS ,MM	H2O	44.9	TBD	68.0	8	TBD	TBD
MISC	POROUS PLUG	49	167	SEHT ,	SFHE	VACUUM	.375	0.3	1	TBD	TBD
MISC	POROUS PLUG	50	168	SEHT ,	SFHE	VACUUM	1.0	1.2	1	TBD	TBD
MISC	PRESSURE CONTROL SYSTEM	51	89	BCISS ,ACS	GO2, GN2	250	.375	50.0	5	TBD	TBD
MISC	PRETREATMENT UNIT, WASTE	52	77	USL ,PMH	ALL	100	2.0	10.0	2	TBD	TBD
MISC	PROCESSING UNIT, POTABL	53	108	BCISS ,MM	H2O	44.9	TBD	77.0	4	TBD	TBD
MISC	PROCESSING UNIT, WASTE	54	107	BCISS ,MM	H2O	44.9	TBD	202.0	2	TBD	TBD
MISC	PUMP	55	23	USL ,PTB	H2O	100	.375	11.4	1	TBD	TBD
MISC	PUMP	56	70	USL ,PMH	ALL	14.7/100	2.0	22.9	2	TBD	TBD
MISC	PUMP	57	208	IMFS ,	H2O	TBD	TBD	35.0	2	TBD	TBD
MISC	PUMP, FEP	58	164	SEHT ,	SFHE	VACUUM	1.0	0.8	2	TBD	TBD
MISC	PUMP, VACUUM	59	165	SEHT ,	SFHE	VACUUM	.375	8.0	1	TBD	TBD
MISC	PUMP, VACUUM	60	57	USL ,PMH	ALL	.25 TORR/14.7	2.0	550.1	3	TBD	TBD
MISC	PUMP, VACUUM GAGE ION	61	166	SEHT ,	SFHE	VACUUM	.5	3.0	1	TBD	TBD
MISC	REFRIGERATOR/FREEZER	62	113	BCISS ,ACS	TBD	TBD	TBD	586.0	3	TBD	TBD
MISC	SEPARATOR, GAS/LIQUID	63	45	USL ,PMH	ALL	TBD	TBD	12.0	7	TBD	TBD
MISC	SORBENT BED	64	93	BCISS ,AR	AIR	30	TBD	90.0	4	TBD	TBD
MISC	TIMES UNIT	65	61	USL ,PMH	H2O	100	.375	95.0	1	HAMILTON STANDARD	TBD
MISC	VACUUM UNIT, PORTABLE	66	81	USL ,PMH	ALL	TBD	TBD	10.0	1	TBD	TBD
MISC	VENT ASSY, NON-PROPULSI	67	162	SEHT ,	SFHE	VACUUM	.375	0.3	1	TBD	TBD
MISC	VENT ASSY, NON-PROPULSI	68	161	SEHT ,	SFHE	VACUUM	1.0	0.3	1	TBD	TBD
MISC	VENT ASSY, NON-PROPULSI	69	163	SEHT ,	SFHE	VACUUM	MULTIPLE	0.5	1	TBD	TBD
MISC	VENT ASSY, NON-PROPULSI	70	132	IMS ,SS	GN2	4000	TBD	TBD	6	TBD	TBD
MISC	VENT ASSY, NON-PROPULSI	70	123	IMS ,RS	GN2	4000	TBD	TBD	12	TBD	TBD
MISC	WATER PROCESSOR	71	16	USL ,PTB	H2O	100	.375	64.2	1	TBD	TBD

TABLE 2.2-5 FLUID SYSTEM HARDWARE - PRESSURE VESSELS

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MDOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
PRESSURE VESSEL		72	203	IMFS	H2O	30	.25	42.0	1	TBO	TBO
PRESSURE VESSEL		73	202	IMFS	REDUCERS	300	.25	101.0	4	TBO	TBO
PRESSURE VESSEL		74	27	USL, PFS	GHE	3000	.25	26.0	6	TBO	TBO
PRESSURE VESSEL		75	28	USL, PFS	AR	3000	.25	36.4	6	TBO	TBO
PRESSURE VESSEL		76	19	USL, PFS	H2O	100	.375	33.1	1	TBO	TBO
PRESSURE VESSEL		77	65	USL, PMH	BRINE	TBO	.375	7.5	1	TBO	TBO
PRESSURE VESSEL		78	201	IMFS	OXIDIZERS	300	.5	101.0	2	TBO	TBO
PRESSURE VESSEL		79	51	USL, PMH	ALL	TBO	2.0	14.0	7	TBO	TBO
PRESSURE VESSEL		80	218	IMS	H2O	30	TBO	76.0	8	TBO	TBO
PRESSURE VESSEL		81	118	IMS, AS	GM2	4000	TBO	TBO	12	TBO	TBO
PRESSURE VESSEL		82	128	IMS, SS	GM2	4000	TBO	TBO	6	TBO	TBO
PRESSURE VESSEL		83	114	ECLES, ACS	LM2	TBO	TBO	170.0	2	TBO	TBO
PRESSURE VESSEL	ACCUMULATORS	84	205	IMFS	H2O	TBO	.25	3.2	1	TBO	TBO
PRESSURE VESSEL	ACCUMULATORS	85	56	IMFS	OXIDIZERS	35	.25/.5	8.3	2	TBO	TBO
PRESSURE VESSEL	ACCUMULATORS	85	204	IMFS	REDUCERS	35	.25/.5	8.3	2	TBO	TBO
PRESSURE VESSEL	CONDENSATE WATER	86	105	ECLES, PMH	H2O	44.9	TBO	108.0	2	TBO	TBO
PRESSURE VESSEL	EMERGENCY WASH WATER	87	104	ECLES, PMH	H2O	44.9	TBO	128.0	2	TBO	TBO
PRESSURE VESSEL	FINE SUPPLEMENT	88	100	ECLES, JDS	HALON 1301	500	TBO	8.0	76	TBO	TBO
PRESSURE VESSEL	HYDROGEN WATER	89	112	ECLES, PMH	H2O	44.9	TBO	000.0	1	TBO	TBO
PRESSURE VESSEL	ISOCURD	90	147	SPHT	SPHE	VACUUM	MULTIPLE	750.0	1	TBO	TBO
PRESSURE VESSEL	LIQUID WASTE	91	44	USL, PMH	ALL	TBO	.25	5.0	7	TBO	TBO
PRESSURE VESSEL	MATERIAL TRANS. CONT.	92	75	USL, PMH	ALL	TBO	TBO	9.9	1	TBO	TBO
PRESSURE VESSEL	PORTABLE	93	29	USL, PFS	ALL BUT H2O	2000	.25	12.5	18	TBO	TBO
PRESSURE VESSEL	POTABLE WATER	94	102	ECLES, PMH	H2O	44.9	TBO	166.0	4	TBO	TBO
PRESSURE VESSEL	PROCESS WATER	95	15	USL, PFS	H2O	100	.375	080.3	1	TBO	TBO
PRESSURE VESSEL	PROCESSED HYDROGEN WATER	96	110	ECLES, PMH	H2O	44.9	TBO	315.0	2	TBO	TBO
PRESSURE VESSEL	STIFFENED MONOCOQUE	97	148	SPHT	SPHE	VACUUM	MULTIPLE	500.0	1	TBO	TBO
PRESSURE VESSEL	STORAGE CONT.	98	21	USL, PFS	H2O	50	.375	15.4	1	TBO	TBO
PRESSURE VESSEL	WASTE CONTAINMENT	99	42	USL, PMH	ALL	TBO	.25	18.0	7	TBO	TBO
PRESSURE VESSEL	WASTE GAS	100	55	USL, PMH	ALL	TBO	2.0	703.4	2	TBO	TBO

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TABLE 2.2-5 FLUID SYSTEM HARDWARE - PRESSURE VESSELS (CONTINUED)

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MDOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
PRESSURE VESSEL	WASTE HOLDING	101	68	USL, PMH	ALL	TBD	2.0	15.0	1	TBD	TBD
PRESSURE VESSEL	WASTE HYDROGEN WATER	102	111	ECLES, NMH	W20	44.9	TBD	282.5	2	TBD	TBD

TABLE 2.2-6 FLUID SYSTEM HARDWARE - REGULATORS

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MDOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
REGULATOR	DOWNSTREAM	103	188	INVS	REDUCERS	3000/75	.25	0.3	2	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
REGULATOR	DOWNSTREAM	103	190	INVS	REDUCERS	3000/75	.25	0.3	2	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
REGULATOR	DOWNSTREAM	104	191	INVS	GN2	750/30	.25	0.6	6	EATON CONSOLIDATED CONTROLS CORP.	30645-5-000 MODIFIED
REGULATOR	DOWNSTREAM	104	212	INVS	GN2	750/30	.25	0.4	4	AERODYNE CONTROLS CORP.	30645-5-000 MODIFIED
REGULATOR	DOWNSTREAM	105	24	USL, PPS	GN2, AR	3000/50	.25	1.0	2	FUTURACRAFT CORP.	400236 MODIFIED
REGULATOR	DOWNSTREAM	106	87	ECLES, ACS	GN2	750/30	.375	1.0	2	TBD	TBD
REGULATOR	DOWNSTREAM	107	43	USL, PMH	ALL	3000/15	1.0	2.0	14	TBD	TBD
REGULATOR	ELECTRONIC, W/RELIEF	108	143	INVS, DS	GN2	4000/750	.375	4.0	2	TBD	TBD

TABLE 2.2-7 FLUID SYSTEM HARDWARE - SENSORS

COMPONENT TYPE	SUB TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE MEOP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
SENSOR	DELTA PRESSURE	123	22	USL , PFS	H2O	100	.375	0.5	1	TBD	TBD
SENSOR	FLOW METER	109	13	USL , PFS	H2O	100	.375	2.0	2	TBD	TBD
SENSOR	FLOW METER	110	41	USL , PMH	ALL	14.7	TBD	0.8	14	TBD	TBD
SENSOR	FLOW METER, GAS	111	174	SEMT ,	SEHE	VACUUM	.375	1.0	1	TBD	TBD
SENSOR	FLOW METER, LIQUID	112	173	SEMT ,	SEHE	VACUUM	1.0	1.0	2	TBD	TBD
SENSOR	MASS METER	113	172	SEMT ,	SEHE	VACUUM	TBD	0.1	1	TBD	TBD
SENSOR	PRESSURE	114	170	SEMT ,	SEHE	VACUUM	.25	0.8	5	TBD	TBD
SENSOR	PRESSURE	115	1	USL , VVS	ALL	.25 (TORR)	.25	1.9	2	TBD	TBD
SENSOR	PRESSURE	116	47	USL , PMH	ALL	14.7	.25	0.4	65	HULITE SEMICONDUCTOR PRODUCTS INC.	HMDE-1100-10
SENSOR	PRESSURE	117	213	IMS ,	H2O	30	.25	0.5	28	MOOG, CARLITON GROUP	2731-0001-5
SENSOR	PRESSURE	117	193	IMS ,	H2O	30	.25	0.5	14	MOOG, CARLITON GROUP	2731-0001-5
SENSOR	PRESSURE	118	192	IMS ,	RE/OX/INERTS	300	.25	0.5	42	TELEDYNE TAPER	2403-200
SENSOR	PRESSURE	119	145	IMS , DS	GN2	750	.25	0.4	2	IMO DELAVAL INC., CEC INSTR. DIV.	41505 MODIFIED
SENSOR	PRESSURE	120	18	USL , PFS	GHE, AR	3000	.25	0.5	2	STATIM DIVISION, SOLARTRON	C5284/A MODIFIED
SENSOR	PRESSURE	121	126	IMS , RS	GN2	4000	.25	0.6	16	EATON CONSOLIDATED CONTROLS CORP.	4150197-20000A1 MOD.
SENSOR	PRESSURE	121	135	IMS , SS	GN2	4000	.25	0.6	10	EATON CONSOLIDATED CONTROLS CORP.	4150197-20000A1 MOD.
SENSOR	PRESSURE	121	144	IMS , DS	GN2	4000	.25	0.6	2	EATON CONSOLIDATED CONTROLS CORP.	4150197-20000A1 MOD.
SENSOR	PRESSURE	122	66	USL , PMH	ALL	TBD	.25	0.7	7	TBD	TBD
SENSOR	QUALITY METER	124	25	USL , PFS	H2O	100	.375	2.2	1	TBD	TBD
SENSOR	QUALITY MONITOR	125	60	USL , PMH	H2O	TBD	TBD	22.1	2	TBD	TBD
SENSOR	TEMPERATURE	126	171	SEMT ,	SEHE	VACUUM	.25	0.2	15	TBD	TBD
SENSOR	TEMPERATURE	127	214	IMS ,	H2O	30	.25	0.1	28	TBD	TBD
SENSOR	TEMPERATURE	128	146	IMS , DS	GN2	750	.25	0.1	2	TBD	TBD
SENSOR	TEMPERATURE	129	6	USL , PFS	GHE, AR	3000	.25	0.2	2	TBD	TBD
SENSOR	TEMPERATURE	130	136	IMS , SS	GN2	4000	.25	0.2	6	TBD	TBD
SENSOR	TEMPERATURE	130	127	IMS , RS	GN2	4000	.25	0.2	12	TBD	TBD
SENSOR	TEMPERATURE	131	49	USL , PMH	ALL	TBD	.25	0.1	14	TBD	TBD
SENSOR	TEMPERATURE	132	62	USL , PMH	H2O	TBD	.25	0.1	1	TBD	TBD

TABLE 2.2-8 FLUID SYSTEM HARDWARE - VALVES

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE WDP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
VALVE	CHECK	133	188	INFS	H2O	30	.25	0.5	8	VACO INDUSTRIES	V1D10746-01
VALVE	CHECK	133	211	IMS	H2O	30	.25	0.5	6	VACO INDUSTRIES	V1D10746-01
VALVE	CHECK	134	187	INFS	REDUCERS	300	.25	0.5	14	VACO INDUSTRIES	4573779
VALVE	CHECK	135	10	USL , PFS	GHE, AR	3000	.25	0.7	1	CIRCLE SEAL CONTROLS	C371A-40
VALVE	CHECK	136	36	USL , PMH	ALL	TBD	.25	0.6	8	TBD	TBD
VALVE	CHECK	137	17	USL , PFS	H2O	100	.375	0.9	2	TBD	TBD
VALVE	CHECK	138	71	USL , PMH	ALL	TBD	.375	0.9	3	TBD	TBD
VALVE	CHECK	139	186	INFS	OXIDIZERS	300	.5	0.2	12	MAROTTA SCIENTIFIC CONTROLS	806232
VALVE	ELECTRIC	140	176	INFS	REDUCERS	15.0	.25	1.5	40	WRIGHT COMPONENTS INC.	15983-1
VALVE	ELECTRIC	141	180	INFS	H2O	30	.25	1.4	24	WRIGHT COMPONENTS INC.	15613
VALVE	ELECTRIC	142	178	INFS	GN2	30	.25	0.5	6	WRIGHT COMPONENTS INC.	15611 2
VALVE	ELECTRIC	142	34	USL , PFS	GHE, AR	50	.25	0.5	36	WRIGHT COMPONENTS INC.	15611 2
VALVE	ELECTRIC	143	177	INFS	REDUCERS	180	.25	0.5	2	MOOG, SPACE PRODUCTS DIVISION	53-159
VALVE	ELECTRIC	144	179	INFS	GN2	800	.25	1.5	2	TBD	TBD
VALVE	ELECTRIC	145	9	USL , PFS	GHE, AR	3000	.25	1.5	12	AMTEK, STRALA DIVISION	435
VALVE	ELECTRIC	146	175	INFS	OXIDIZERS	15	.375	0.6	34	WRIGHT COMPONENTS INC.	15751
VALVE	ELECTRIC	147	32	USL , PFS	H2O	100	.375	1.7	47	MOOG, SPACE PRODUCTS DIVISION	54 478
VALVE	ELECTRIC	148	181	INFS	ALL	15	.5	1.5	8	WRIGHT COMPONENTS INC.	15975
VALVE	ELECTRIC	149	38	USL , PMH	ALL	3000	1.0	2.2	50	AMTEK, STRALA DIVISION	525-503
VALVE	ELECTRIC	150	4	USL , VWS	ALL	.25 (TORR)	6.0	15.0	4	TBD	TBD
VALVE	ELECTRIC	151	209	IMS	H2O	30	TBD	3.0	88	TBD	TBD
VALVE	ELECTRIC	152	63	USL , PMH	ALL	TBD	TBD	1.7	2	TBD	TBD
VALVE	EQUALIZATION	153	90	EXLSS , ACS	AIR	14.9	TBD	6.0	9	TBD	TBD
VALVE	FLOW RESTRICTOR	154	20	USL , PFS	H2O	100	.375	0.3	1	TBD	TBD
VALVE	FLOW RESTRICTOR	155	8	USL , PFS	GHE, AR	3000	.375	0.2	2	TBD	TBD
VALVE	MANUAL, SERVICE	156	119	IMS , RS	GN2	4000	.5	2.0	2	VACO INDUSTRIES	V1Z10330-01
VALVE	MANUAL, SHUT-OFF	157	155	SPHT	SEWE	VACUUM	1.0	1.0	1	TBD	TBD
VALVE	MANUAL, SHUT-OFF	158	2	USL , VWS	ALL	.25 (TORR)	2.0	1.4	22	TBD	TBD
VALVE	MANUAL, SHUT-OFF	159	5	USL , VWS	ALL	.25 (TORR)	6.0	0.7	2	TBD	TBD
VALVE	RELIEF	160	88	EXLSS , ACS	AIR	14.9	.25	1.0	5	TBD	TBD
VALVE	RELIEF	161	185	INFS	H2O	30	.25	1.0	1	TBD	TBD
VALVE	RELIEF	161	210	IMS	H2O	30	.25	1.0	8	TBD	TBD
VALVE	RELIEF	162	183	INFS	REDUCERS	300	.25	2.0	8	TBD	TBD
VALVE	RELIEF	163	52	USL , PMH	ALL	TBD	.25	1.5	5	TBD	TBD
VALVE	RELIEF	164	182	INFS	OXIDIZERS	300	.5	2.0	2	TBD	TBD

TABLE 2.2-8 FLUID SYSTEM HARDWARE - VALVES (CONTINUED)

COMPONENT TYPE	SUB-TYPE	SHEET NO.	ITEM NO.	PROGRAM APPLICATION	USAGE (MEDIA)	PRESSURE DROP (PSIA)	PORT SIZE (IN)	APPROX. MASS (LB)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
VALVE	RELIEF	165	158	SEHT ,	SEHE	VACUUM	1.0	3.0	2	TBO	TBO
VALVE	RELIEF	166	159	SEHT ,	SEHE	VACUUM	1.0	2.0	1	TBO	TBO
VALVE	RELIEF	167	53	USL ,PMH	ALL	TBO	TBO	3.9	2	TBO	TBO
VALVE	RELIEF W/EO	168	122	INS ,RS	GN2	4000	.25	TBO	12	TBO	TBO
VALVE	RELIEF W/EO	168	131	INS ,SS	GN2	4000	.25	TBO	6	TBO	TBO
VALVE	SEAL-OFF, VACUUM	169	157	SEHT ,	SEHE	VACUUM	0.5	0.5	4	TBO	TBO
VALVE	SEAL-OFF, VACUUM	170	156	SEHT ,	SEHE	VACUUM	1.0	1.0	1	TBO	TBO
VALVE	SOLENOID, LATCHING	171	154	SEHT ,	SEHE	VACUUM	1.0	3.0	4	TBO	TBO
VALVE	SOLENOID, LATCHING	172	129	INS ,SS	GN2	4000	.25	1.6	12	TBO	TBO
VALVE	SOLENOID, LATCHING	172	139	INS ,DS	GN1	4000	.25	1.6	3	TBO	TBO
VALVE	SOLENOID, LATCHING	172	120	INS ,RS	GN2	4000	.25	1.6	24	TBO	TBO
VALVE	SOLENOID, LATCHING	173	140	INS ,DS	GN2	750	TBO	TBO	3	TBO	TBO
VALVE	SOLENOID, LATCHING W/BP	174	152	SEHT ,	SEHE	VACUUM	.375	1.5	6	TBO	TBO
VALVE	SOLENOID, LATCHING W/BP	175	153	SEHT ,	SEHE	VACUUM	1.0	4.0	22	TBO	TBO
VALVE	TORQUE MOTOR	176	130	INS ,SS	GN2	4000	.25	1.6	6	TBO	TBO
VALVE	TORQUE MOTOR	176	121	INS ,RS	GN2	4000	.25	1.6	4	TBO	TBO
VALVE	TORQUE MOTOR	176	137	INS ,DS	GN2	4000	.25	1.6	4	TBO	TBO
VALVE	TORQUE MOTOR	177	138	INS ,DS	GN2	750	.25	1.6	12	TBO	TBO
VALVE	VENT ASSY	178	74	USL ,PMH	ALL	TBO	2.0	3.9	2	TBO	TBO

2.3 FLUID SYSTEM HARDWARE LISTING BY FLUID/MEDIA TYPE

Tables 2.3-1 through 2.3-23 list the components by the fluid or media usage.

TABLE 2.3-1 FLUID SYSTEM HARDWARE - AIR

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE REQD (PSI)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
AIR	11	92	ECLES,AR	FILTER	AVIONICS PARTICULATE	14.9	TBD	17.0	4	TBD	TBD
AIR	12	95	ECLES,AR	FILTER	BACTERIA/PARTICULATE	14.9	TBD	60.0	7	TBD	TBD
AIR	21	91	ECLES,TMC	MISC	CABIN COOLING PKG	14.9	TBD	123.0	7	TBD	TBD
AIR	22	99	ECLES,AR	MISC	CATALYTIC CRUISER	30	TBD	80.0	4	TBD	TBD
AIR	23	94	ECLES,AR	MISC	CO2 REDUCTION, BOSCH	30	.25	328.0	4	TBD	TBD
AIR	47	98	ECLES,AR	MISC	MONITOR, ATMOSPHERE	14.9	TBD	57.0	5	TBD	TBD
AIR	64	93	ECLES,AR	MISC	ISORIENT BED	30	TBD	90.0	4	TBD	TBD
AIR	153	90	ECLES,ACS	VALVE	EQUALIZATION	14.9	TBD	6.0	9	TBD	TBD
AIR	160	88	ECLES,ACS	VALVE	RELIEF	14.9	.25	1.0	5	TBD	TBD

TABLE 2.3-2 FLUID SYSTEM HARDWARE - AIR AND CO2

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE REQD (PSI)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
AIR, CO2	46	96	ECLES,AR	MISC	MOLECULAR SIEVE, 4-BED	30	TBD	322.0	4	TBD	TBD

TABLE 2.3-3 FLUID SYSTEM HARDWARE - ALL

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE (PSI)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
ALL	1	48	USL, PMH	DISCONNECT		14.7	.25	0.8	7	SYNTRONICS INC.	502040-1011 & -3012
ALL	3	58	USL, PMH	DISCONNECT		14.7	.375	0.4	17	SYNTRONICS INC.	592002-3 & -4
ALL	4	37	USL, PMH	DISCONNECT		14.7	1.0	1.0	101	TBD	TBD
ALL	6	64	USL, PMH	DISCONNECT		14.7	2.0	1.8	10	TBD	TBD
ALL	6	3	USL, VVS	DISCONNECT		.25 (TORR)	2.0	1.8	22	TBD	TBD
ALL	14	184	IMFS	FILTER	INLINE	300	.5	0.5	4	TBD	TBD
ALL	17	39	USL, PMH	FILTER	INLINE	TBD	TBD	1.0	13	TBD	TBD
ALL	30	40	USL, PMH	MISC	DIFFUSER, Suction	300	1.0	0.4	14	TBD	TBD
ALL	40	84	USL, PMH	MISC	FLEX HOSE, TEFLOX LINED	14.7	1.0	0.3	30	TBD	TBD
ALL	41	78	USL, PMH	MISC	FLEX HOSE, TEFLOX LINED	14.7	1.0	0.5	28	TBD	TBD
ALL	42	50	USL, PMH	MISC	FLEX HOSE, TEFLOX LINED	14.7	1.0	0.8	7	TBD	TBD
ALL	43	68	USL, PMH	MISC	FLEX HOSE, TEFLOX LINED	100	2.0	1.9	12	TBD	TBD
ALL	52	77	USL, PMH	MISC	PRETREATMENT UNIT, WASTE	100	2.0	10.0	2	TBD	TBD
ALL	56	70	USL, PMH	MISC	PUMP	14.7/100	2.0	22.9	2	TBD	TBD
ALL	60	57	USL, PMH	MISC	PUMP, VACUUM	.25 TORR/14.7	2.0	550.1	3	TBD	TBD
ALL	63	45	USL, PMH	MISC	SEPARATOR, GAS/LIQUID	TBD	TBD	12.0	7	TBD	TBD
ALL	66	81	USL, PMH	MISC	VACUUM UNIT, VARIABLE	TBD	TBD	17.0	1	TBD	TBD
ALL	79	51	USL, PMH	PRESSURE VESSEL		TBD	2.0	14.0	7	TBD	TBD
ALL	91	44	USL, PMH	PRESSURE VESSEL	LIQUID WASTE	TBD	.25	5.0	7	TBD	TBD
ALL	92	75	USL, PMH	PRESSURE VESSEL	MATERIAL TRANS. CONT.	TBD	TBD	9.9	1	TBD	TBD
ALL	99	42	USL, PMH	PRESSURE VESSEL	WASTE CONTAINMENT	TBD	.25	18.0	7	TBD	TBD
ALL	100	55	USL, PMH	PRESSURE VESSEL	WASTE GAS	TBD	2.0	703.4	2	TBD	TBD
ALL	101	68	USL, PMH	PRESSURE VESSEL	WASTE HOLDING	TBD	2.0	15.0	1	TBD	TBD
ALL	107	43	USL, PMH	REGULATOR		3000/15	1.0	2.0	14	TBD	TBD
ALL	110	41	USL, PMH	SENSOR	IFLOW METER	14.7	TBD	0.8	14	TBD	TBD
ALL	115	1	USL, VVS	SENSOR	PRESSURE	.25 (TORR)	.25	1.9	2	TBD	TBD
ALL	116	47	USL, PMH	SENSOR	PRESSURE	14.7	.25	0.4	65	MULTE SIMICONDUCTOR PRODUCTS INC.	BMDE-1100-10
ALL	122	66	USL, PMH	SENSOR	PRESSURE	TBD	.25	0.7	7	TBD	TBD
ALL	131	49	USL, PMH	SENSOR	TEMPERATURE	TBD	.25	0.1	14	TBD	TBD
ALL	136	36	USL, PMH	VALVE	CHECK	TBD	.25	0.6	8	TBD	TBD
ALL	138	71	USL, PMH	VALVE	CHECK	TBD	.375	0.9	3	TBD	TBD
ALL	148	101	IMFS	VALVE	ELECTRIC	15	.5	1.5	8	WRIGHT COMPONENTS INC.	15975
ALL	149	38	USL, PMH	VALVE	ELECTRIC	3000	1.0	2.2	50	ANALOG, STRATA DIVISION	525-503
ALL	150	4	USL, VVS	VALVE	ELECTRIC	.25 (TORR)	6.0	15.0	4	TBD	TBD
ALL	152	63	USL, PMH	VALVE	ELECTRIC	TBD	TBD	1.7	2	TBD	TBD
ALL	158	2	USL, VVS	VALVE	MANUAL, SHUT-OFF	.25 (TORR)	2.0	1.4	22	TBD	TBD

TABLE 2.3-3 FLUID SYSTEM HARDWARE - ALL (CONTINUED)

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE REQ. (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
ALL	159	5	USL.VVS	VALVE	MANUAL, SHUT-OFF	.25 (TORQ)	6.0	0.7	2	TBO	TBO
ALL	163	52	USL.PMS	VALVE	RELIEF	TBO	.25	1.5	5	TBO	TBO
ALL	167	53	USL.PMS	VALVE	RELIEF	TBO	TBO	3.9	2	TBO	TBO
ALL	178	74	USL.PMS	VALVE	VENT ASST	TBO	2.0	3.9	2	TBO	TBO

ALL INCLUDES GHe, Ar, H₂O, FREON AND CO₂TABLE 2.3-4 FLUID SYSTEM HARDWARE - ALL BUT H₂

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE REQ. (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
ALL BUT H ₂ O	93	29	USL.PFS	PRESSURE VESSEL	PORTABLE	2000	.25	12.5	18	TBO	TBO

TABLE 2.3-5 FLUID SYSTEM HARDWARE - Ar

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE REQ. (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
Ar	75	28	USL.PFS	PRESSURE VESSEL		3000	.25	36.4	6	TBO	TBO

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TABLE 2.3-6 FLUID SYSTEM HARDWARE - BRINE

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MSCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENIX PART NUMBER
BRINE	71	65	USL.PNH	PRESSURE VESSEL		TBD	.375	7.5	1	TBD	TBD

TABLE 2.3-7 FLUID SYSTEM HARDWARE - FECS

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MSCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENIX PART NUMBER
FECS	34	117	ECLES.MH	MISC	FECAL STORAGE	TBD	TBD	52.0	1	TBD	TBD

TABLE 2.3-8 FLUID SYSTEM HARDWARE - GH2

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MSCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENIX PART NUMBER
GH2	144	179	11MFS.	VALVE	ELECTRIC	800	.25	1.5	2	TBD	TBD

TABLE 2.3-9 FLUID SYSTEM HARDWARE - GHE

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MSCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENIX PART NUMBER
GHE	26	67	USL.PNH	MISC	COMPRESSOR, REFRIGERATION	300	.75	141.1	1	TBD	TBD
GHE	74	27	USL.PFS	PRESSURE VESSEL		3000	.25	26.0	6	TBD	TBD

TABLE 2.3-10 FLUID SYSTEM HARDWARE - GN2

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MOP (Psi)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
GN2	1	200	1MFS, 1MS	DISCONNECT		750	.25	0.8	4	SYNTHETICS INC.	502040-1011 & -3012
GN2	9	125	1MS, RS	DISCONNECT		4000	TBD	TBD	4	TBD	TBD
GN2	8	142	1MS, DS	DISCONNECT		4000	TBD	TBD	4	TBD	TBD
GN2	8	134	1MS, SS	DISCONNECT		4000	TBD	TBD	8	TBD	TBD
GN2	16	124	1MS, RS	FILTER	INLINE	4000	TBD	TBD	4	TBD	TBD
GN2	16	141	1MS, DS	FILTER	INLINE	4000	TBD	TBD	4	TBD	TBD
GN2	16	133	1MS, SS	FILTER	INLINE	4000	TBD	TBD	8	TBD	TBD
GN2	27	115	1ECLSS, ACS	MISC	CONTROL, M2 RESUPPLY PRES	TBD	TBD	57.0	1	TBD	TBD
GN2	70	123	1MS, RS	MISC	VENT ASSY, NON-PROPULSIVE	4000	TBD	TBD	12	TBD	TBD
GN2	70	132	1MS, SS	MISC	VENT ASSY, NON-PROPULSIVE	4000	TBD	TBD	6	TBD	TBD
GN2	81	118	1MS, RS	PRESSURE VESSEL		4000	TBD	TBD	12	TBD	TBD
GN2	82	128	1MS, SS	PRESSURE VESSEL		4000	TBD	TBD	6	TBD	TBD
GN2	104	212	1MS	REGULATOR	DOWNSTREAM	750/30	.25	0.6	4	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED
GN2	104	191	1MFS	REGULATOR	DOWNSTREAM	750/30	.25	0.6	6	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED
GN2	106	87	1ECLSS, ACS	REGULATOR	DOWNSTREAM	750/30	.375	1.0	2	TBD	TBD
GN2	108	143	1MS, DS	REGULATOR	ELECTRONIC, W/RELIEF	4000/750	.375	4.0	2	TBD	TBD
GN2	119	145	1MS, DS	SENSOR	PRESSURE	750	.75	0.4	2	TBD INFLAT TUB, CPC INSTR DIV	615405 MODIFIED
GN2	121	135	1MS, SS	SENSOR	PRESSURE	4000	.25	0.6	10	EATON CONSOLIDATED CONTROLS CORP.	415G197-2000A1 MOD.
GN2	121	144	1MS, DS	SENSOR	PRESSURE	4000	.25	0.6	2	EATON CONSOLIDATED CONTROLS CORP.	415G197-2000A1 MOD.
GN2	121	126	1MS, RS	SENSOR	PRESSURE	4000	.25	0.6	16	EATON CONSOLIDATED CONTROLS CORP.	415G197-2000A1 MOD.
GN2	128	146	1MS, DS	SENSOR	TEMPERATURE	750	.25	0.1	2	TBD	TBD
GN2	130	136	1MS, SS	SENSOR	TEMPERATURE	4000	.25	0.2	6	TBD	TBD
GN2	130	127	1MS, RS	SENSOR	TEMPERATURE	4000	.25	0.2	12	TBD	TBD
GN2	142	178	1MFS	VALVE	ELECTRIC	30	.25	0.5	6	WRIGHT COMPONENTS INC.	15611-2
GN2	156	119	1MS, RS	VALVE	MANUAL, SERVICE	4000	.5	2.0	2	VACCO INDUSTRIES	VIE10130-01
GN2	168	131	1MS, SS	VALVE	RELIEF W/NO	4000	.25	TBD	6	TBD	TBD
GN2	168	122	1MS, RS	VALVE	RELIEF W/NO	4000	.25	TBD	12	TBD	TBD
GN2	172	139	1MS, DS	VALVE	SOLENOID, LATCHING	4000	.25	1.6	3	TBD	TBD
GN2	172	120	1MS, RS	VALVE	SOLENOID, LATCHING	4000	.25	1.6	24	TBD	TBD
GN2	172	129	1MS, SS	VALVE	SOLENOID, LATCHING	4000	.25	1.6	12	TBD	TBD
GN2	173	140	1MS, DS	VALVE	SOLENOID, LATCHING	750	TBD	TBD	3	TBD	TBD
GN2	176	121	1MS, RS	VALVE	TORQUE MOTOR	4000	.25	1.6	4	TBD	TBD
GN2	176	130	1MS, SS	VALVE	TORQUE MOTOR	4000	.25	1.6	8	TBD	TBD
GN2	176	137	1MS, DS	VALVE	TORQUE MOTOR	4000	.25	1.6	4	TBD	TBD
GN2	177	138	1MS, DS	VALVE	TORQUE MOTOR	750	.25	1.6	12	TBD	TBD

TABLE 2.3-11 FLUID SYSTEM HARDWARE - GHe AND Ar

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE RCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
GHe, Ar	2	11	USL.PFS	DIECONNECT		3000	.25	0.6	12	PTI TECHNOLOGIES, INC.	7537191-4
GHe, Ar	35	35	USL.PFS	MISC	FLEX HOSE	50	.25	0.2	40	TBO	TBO
GHe, Ar	105	24	USL.PFS	REGULATOR	DOWNSTREAM	3000/50	.25	1.8	2	FUTURECRANT CORP.	400236 MODIFIED
GHe, Ar	120	18	USL.PFS	SENSOR	PRESSURE	3000	.25	0.5	2	STATAM DIVISION, SOLARTON	C19284/A MODIFIED
GHe, Ar	120	6	USL.PFS	SENSOR	TEMPERATURE	3000	.25	0.2	2	TBO	TBO
GHe, Ar	135	10	USL.PFS	VALVE	CHECK	3000	.25	0.7	1	CIRCLE SEAL CONTROLS	C87/A-40
GHe, Ar	142	34	USL.PFS	VALVE	ELECTRIC	50	.25	0.5	36	WRIGHT COMPONENTS INC.	15611-2
GHe, Ar	145	9	USL.PFS	VALVE	ELECTRIC	3000	.25	1.5	12	AMETEK, STRALA DIVISION	435
GHe, Ar	155	8	USL.PFS	VALVE	FLOW RESTRICTOR	3000	.375	0.2	2	TBO	TBO

TABLE 2.3-12 FLUID SYSTEM HARDWARE - G02 AND GN2

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE RCP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
G02, GN2	51	89	ICLAS, ACS	MISC	PRESSURE CONTROL SYSTEM	250	.375	50.0	5	TBO	TBO

TABLE 2.3-13 FLUID SYSTEM HARDWARE - H₂O

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE (PSI)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
H2O	1	199	11MS, 11MS	DISCONNECT		30	.25	0.8	16	SYNETHICS INC.	502040-1011 & -3012
H2O	1	30	1USL.PFS	DISCONNECT		100	.25	0.8	44	SYNETHICS INC.	502040-1011 & -3012
H2O	3	33	1USL.PFS	DISCONNECT		100	.375	0.4	36	SYNETHICS INC.	592002-3 & -4
H2O	7	217	11MS,	DISCONNECT		30	TBD	TBD	4	TBD	TBD
H2O	13	14	1USL.PFS	FILTER	INLINE	100	.375	5.5	1	TBD	TBD
H2O	15	215	11MS,	FILTER	INLINE	30	TBD	1.0	TBD	TBD	TBD
H2O	18	73	1USL.PMH	FILTER	MULTIPLE	100	.375	48.5	1	TBD	TBD
H2O	31	103	1ECLSS.WMH	MISC	DISPENSER, POTABLE WATER	44.9	TBD	41.0	2	TBD	TBD
H2O	33	109	1ECLSS.WMH	MISC	EYEWASH	44.9	TBD	1.0	1	TBD	TBD
H2O	34	7	1USL.PFS	MISC	FLEX HOSE	50	.375	0.4	1	TBD	TBD
H2O	37	12	1USL.PFS	MISC	FLEX HOSE	100	.375	1.1	1	TBD	TBD
H2O	45	216	11MS,	MISC	HEATER	N/A	N/A	0.5	305	TBD	TBD
H2O	48	106	1ECLSS.WMH	MISC	IONITON, WATER QUALITY	44.9	TBD	68.0	8	TBD	TBD
H2O	53	108	1ECLSS.WMH	MISC	PROCESSING UNIT, POTABLE	44.9	TBD	77.0	4	TBD	TBD
H2O	54	107	1ECLSS.WMH	MISC	PROCESSING UNIT, WASTE BY	44.9	TBD	202.0	2	TBD	TBD
H2O	55	23	1USL.PFS	MISC	PUMP	100	.375	11.4	1	TBD	TBD
H2O	57	209	11MS,	MISC	PUMP	TBD	TBD	35.0	4	TBD	TBD
H2O	65	61	1USL.PMH	MISC	TYNES UNIT	100	.375	95.0	1	HAMILTON STANDARD	TBD
H2O	71	16	1USL.PFS	MISC	WATER PROCESSOR	100	.375	66.2	1	TBD	TBD
H2O	72	203	11MS,	PRESSURE VESSEL		30	.25	42.0	1	TBD	TBD
H2O	76	19	1USL.PFS	PRESSURE VESSEL		100	.375	33.1	1	TBD	TBD
H2O	80	218	11MS,	PRESSURE VESSEL		30	TBD	76.0	8	TBD	TBD
H2O	84	205	11MS,	PRESSURE VESSEL	ACCUMULATORS	TBD	.25	3.2	1	TBD	TBD
H2O	86	105	1ECLSS.WMH	PRESSURE VESSEL	CONDENSATE WATER	44.9	TBD	108.0	2	TBD	TBD
H2O	87	104	1ECLSS.WMH	PRESSURE VESSEL	EMERGENCY WASH WATER	44.9	TBD	128.0	2	TBD	TBD
H2O	89	112	1ECLSS.WMH	PRESSURE VESSEL	HYGIENE WATER	44.9	TBD	000.0	1	TBD	TBD
H2O	94	102	1ECLSS.WMH	PRESSURE VESSEL	POTABLE WATER	44.9	TBD	166.0	4	TBD	TBD
H2O	95	15	1USL.PFS	PRESSURE VESSEL	PROCESS WATER	100	.375	080.3	1	TBD	TBD
H2O	96	110	1ECLSS.WMH	PRESSURE VESSEL	PROCESS HYGIENE WATER	44.9	TBD	315.0	2	TBD	TBD
H2O	98	21	1USL.PFS	PRESSURE VESSEL	STORAGE CONT.	50	.375	15.4	1	TBD	TBD
H2O	102	111	1ECLSS.WMH	PRESSURE VESSEL	WASTE HYGIENE WATER	44.9	TBD	292.5	2	TBD	TBD
H2O	109	13	1USL.PFS	SENSOR	FLOW METER	100	.375	2.0	2	TBD	TBD
H2O	117	213	11MS,	SENSOR	PRESSURE	30	.25	0.5	28	KCOG, CARLETON GROUP	2731-0001-5
H2O	117	193	11MS,	SENSOR	PRESSURE	30	.25	0.5	14	KCOG, CARLETON GROUP	2731-0001-5
H2O	123	22	1USL.PFS	SENSOR	DELTA PRESSURE	100	.375	0.5	1	TBD	TBD
H2O	124	25	1USL.PFS	SENSOR	QUALITY METER	100	.375	2.2	1	TBD	TBD

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TABLE 2.3-13 FLUID SYSTEM HARDWARE - H₂O (CONTINUED)

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MEOP (psia)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
H ₂ O	125	60	USL, PMH	SENSOR	QUALITY MONITOR	TBD	TBD	22.1	2	TBD	TBD
H ₂ O	127	214	IMS,	SENSOR	TEMPERATURE	30	.25	0.1	28	TBD	TBD
H ₂ O	132	62	USL, PMH	SENSOR	TEMPERATURE	TBD	.25	0.1	1	TBD	TBD
H ₂ O	133	211	IMS,	VALVE	CHECK	30	.25	0.5	6	VACCO INDUSTRIES	VID10746-01
H ₂ O	133	188	IMS,	VALVE	CHECK	30	.25	0.5	8	VACCO INDUSTRIES	VID10746-01
H ₂ O	137	17	USL, PFS	VALVE	CHECK	100	.375	0.9	2	TBD	TBD
H ₂ O	141	188	IMS,	VALVE	ELECTRIC	30	.25	1.4	24	WRIGHT COMPONENTS INC.	15613
H ₂ O	147	32	USL, PFS	VALVE	ELECTRIC	100	.375	1.7	47	WOOD, SPACE PRODUCTS DIVISION	52-178
H ₂ O	151	209	IMS,	VALVE	ELECTRIC	30	TBD	3.0	88	TBD	TBD
H ₂ O	154	20	USL, PFS	VALVE	FLAM RESTRICTOR	100	.375	0.3	1	TBD	TBD
H ₂ O	161	210	IMS,	VALVE	RELIEF	30	.25	1.0	8	TBD	TBD
H ₂ O	161	185	IMS,	VALVE	RELIEF	30	.25	1.0	1	TBD	TBD

TABLE 2.3-14 FLUID SYSTEM HARDWARE - H₂O, CO₂ AND CH₂

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MEOP (psia)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
H ₂ O, CO ₂ , CH ₂	32	97	ECLES, AR	MISC	ELECTROVALVE UNIT, MOM	200	TBD	232.0	4	TBD	TBD

TABLE 2.3-15 FLUID SYSTEM HARDWARE - HALON 1301

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE HCF (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
HALON 1301	28	101	ECLES, IDS	MSFC	CONTROLLER, PYRO	500	N/A	2.0	7	TBD	TBD
HALON 1301	88	100	ECLES, IDS	PRESSURE VESSEL	FINE SUPPRESSANT	500	TBD	8.0	76	TBD	TBD

TABLE 2.3-16 FLUID SYSTEM HARDWARE - LHe

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE HCF (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
LHe	38	72	USL, PMH	MSFC	FLUX NOSE	300	.75	0.6	4	TBD	TBD

TABLE 2.3-17 FLUID SYSTEM HARDWARE - LN2

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE HCF (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
LN2	28	59	USL, PMH	MSFC	CRYO UNIT, LPZ PRODUCTION	300	.25	33.6	1	TBD	TBD
LN2	83	114	ECLES, ACS	PRESSURE VESSEL		TBD	TBD	170.0	2	TBD	TBD

TABLE 2.3-18 FLUID SYSTEM HARDWARE - OXIDIZERS

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MOP (Psi)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
OXIDIZERS	3	195	11MF8	DISCONNECT		15	.375	0.4	16	SYNTRICS INC.	592002-3 & 4
OXIDIZERS	25	206	11MF8	MISC	COMPRESSOR	300	.5	30.0	2	TBD	TBD
OXIDIZERS	78	201	11MF8	PRESSURE VESSEL		300	.5	101.8	2	TBD	TBD
OXIDIZERS	85	56	11MF8	PRESSURE VESSEL	ACCUMULATORS	35	.25/.5	8.3	2	TBD	TBD
OXIDIZERS	103	190	11MF8	REGULATOR	DOWNSTREAM	300/75	.25	0.3	2	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
OXIDIZERS	139	186	11MF8	VALVE	CHECK	300	.5	0.2	12	WABCO SCIENTIFIC CONTROLS	806232
OXIDIZERS	146	175	11MF8	VALVE	ELECTRIC	15	.375	0.6	34	WRIGHT COMPONENTS INC.	15751
OXIDIZERS	164	182	11MF8	VALVE	RELIEF	300	.5	2.0	2	TBD	TBD

TABLE 2.3-19 FLUID SYSTEM HARDWARE - REDUCERS, OXIDIZERS, AND INERTS

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MOP (Psi)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
REDUCERS	118	192	11MF8	SENSOR	PRESSURE	300	.25	0.5	42	TELEDYNE TAPER	2403-200

TABLE 2.3-20 FLUID SYSTEM HARDWARE - REDUCERS

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MOP (Psi)	PORT SIZE (in)	APPROX. WEIGHT (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
REDUCERS	1	196	11MF8, LABS	DISCONNECT		15	.25	0.8	12	SYNTRICS INC.	502040-1011 & -3012
REDUCERS	1	197	11MF8, ECLSS	DISCONNECT		180	.25	0.8	2	SYNTRICS INC.	502040 1011 & -3012
REDUCERS	1	198	11MF8, ATT PAYLOADS	DISCONNECT		800	.25	0.8	2	SYNTRICS INC.	502040 1011 & 3012
REDUCERS	24	207	11MF8	MISC	COMPRESSOR	300	.25	30.0	2	TBD	TBD
REDUCERS	73	202	11MF8	PRESSURE VESSEL		300	.25	101.8	4	TBD	TBD
REDUCERS	85	204	11MF8	PRESSURE VESSEL	ACCUMULATORS	35	.25/.5	8.3	2	TBD	TBD
REDUCERS	103	189	11MF8	REGULATOR	DOWNSTREAM	300/75	.25	0.3	2	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED
REDUCERS	134	187	11MF8	VALVE	CHECK	300	.25	0.5	14	VACCO INDUSTRIES	45737/9
REDUCERS	140	176	11MF8	VALVE	ELECTRIC	15.0	.25	1.5	40	WRIGHT COMPONENTS INC.	15983.1
REDUCERS	143	177	11MF8	VALVE	ELECTRIC	180	.25	0.5	2	MOOG, SPACE PRODUCTS DIVISION	53 159
REDUCERS	162	183	11MF8	VALVE	RELIEF	300	.25	2.0	8	TBD	TBD

TABLE 2.3-21 FLUID SYSTEM HARDWARE - SFHe

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE MCFP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
SFHe	5	149	ISFHT.	DISCONNECT	EMERGENCY	VACUUM	1.0	2.0	2	TBO	TBO
SFHe	9	150	ISFHT.	DISCONNECT	EMERGENCY	VACUUM	1.0	3.0	2	TBO	TBO
SFHe	20	160	ISFHT.	MISC	BURST DISK	VACUUM	1.0	0.9	2	TBO	TBO
SFHe	39	151	ISFHT.	MISC	FLEX HOSE	VACUUM	1.0	8.0	2	TBO	TBO
SFHe	44	169	ISFHT.	MISC	HEAT EXCHANGER	VACUUM	MULTIPLE	3.0	1	TBO	TBO
SFHe	49	167	ISFHT.	MISC	POROUS PLUG	VACUUM	.375	0.3	1	TBO	TBO
SFHe	50	168	ISFHT.	MISC	POROUS PLUG	VACUUM	1.0	1.2	1	TBO	TBO
SFHe	58	164	ISFHT.	MISC	PUMP, FEP	VACUUM	1.0	0.8	2	TBO	TBO
SFHe	59	165	ISFHT.	MISC	PUMP, VACUUM	VACUUM	.375	8.0	1	TBO	TBO
SFHe	61	166	ISFHT.	MISC	PUMP, VACUUM GAGE ION	VACUUM	.5	3.0	1	TBO	TBO
SFHe	67	162	ISFHT.	MISC	VENT ASSY, NON-PROPULSIVE	VACUUM	.375	0.3	1	TBO	TBO
SFHe	68	161	ISFHT.	MISC	VENT ASSY, NON-PROPULSIVE	VACUUM	1.0	0.3	1	TBO	TBO
SFHe	69	163	ISFHT.	MISC	VENT ASSY, NON-PROPULSIVE	VACUUM	MULTIPLE	0.5	1	TBO	TBO
SFHe	90	147	ISFHT.	PRESSURE VESSEL	ISOGRID	VACUUM	MULTIPLE	750.0	1	TBO	TBO
SFHe	97	148	ISFHT.	PRESSURE VESSEL	STIFFENED MONOCOQUE	VACUUM	MULTIPLE	500.0	1	TBO	TBO
SFHe	111	174	ISFHT.	SENSOR	FLOW METER, GAS	VACUUM	.375	1.0	1	TBO	TBO
SFHe	112	173	ISFHT.	SENSOR	FLOW METER, LIQUID	VACUUM	1.0	1.0	2	TBO	TBO
SFHe	113	172	ISFHT.	SENSOR	MASS METER	VACUUM	TBO	0.1	1	TBO	TBO
SFHe	114	170	ISFHT.	SENSOR	PRESSURE	VACUUM	.25	0.8	5	TBO	TBO
SFHe	126	171	ISFHT.	SENSOR	TEMPERATURE	VACUUM	.25	0.2	15	TBO	TBO
SFHe	157	155	ISFHT.	VALVE	MANUAL, SHUT-OFF	VACUUM	1.0	1.0	1	TBO	TBO
SFHe	165	158	ISFHT.	VALVE	RELIEF	VACUUM	1.0	3.0	2	TBO	TBO
SFHe	166	159	ISFHT.	VALVE	RELIEF	VACUUM	1.0	2.0	1	TBO	TBO
SFHe	169	157	ISFHT.	VALVE	SEAL-OFF, VACUUM	VACUUM	0.5	0.5	4	TBO	TBO
SFHe	170	156	ISFHT.	VALVE	SEAL-OFF, VACUUM	VACUUM	1.0	1.0	1	TBO	TBO
SFHe	171	154	ISFHT.	VALVE	SOLENOID, LATCHING	VACUUM	1.0	3.0	4	TBO	TBO
SFHe	174	152	ISFHT.	VALVE	SOLENOID, LATCHING W/BPR	VACUUM	.375	1.5	6	TBO	TBO
SFHe	175	153	ISFHT.	VALVE	SOLENOID, LATCHING W/BPR	VACUUM	1.0	4.0	22	TBO	TBO

TABLE 2.3-22 FLUID SYSTEM HARDWARE - TBD

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE NECP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
TBD	18	54	UUL, PNH	ENGINE	BURNER, CATALYTIC	TBD	2.0	60.0	2	TBD	TBD
TBD	62	113	ECLES, ACS	MISC	REFRIGERATOR/FREEZER	TBD	TBD	566.0	3	TBD	TBD

TABLE 2.3-23 FLUID SYSTEM HARDWARE - URINE BRINE

USAGE (MEDIA)	SHEET NUMBER	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	SUB-TYPE	PRESSURE NECP (psia)	PORT SIZE (in)	APPROX. MASS (lb)	QUANTITY REQUIRED	VENDOR	VENDOR PART NUMBER
URINE BRINE	19	116	ECLES, MN	MISC	BRINE STORAGE	TBD	TBD	33.0	6	TBD	TBD

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2.4 FLUID SYSTEM HARDWARE BY INDIVIDUAL DETAIL DATA SHEET

The following listings are detailed descriptions of the individual components. Components that are described by specific vendor part numbers were assigned that number from the Martin Marietta Propulsion Component Database. Vendor part numbers that were assigned from the database, were assigned by matching the individual component requirements as they are known with the capabilities of existing flight qualified hardware. In all cases the assigned part number indicates only that the component characteristics matches the requirements. It does not necessarily imply that the component has been selected for the particular application. Other components may fit equally well and the component selected is therefore only considered a representative fit. The components with a vendor part number of TBD have not been assigned one by the design and information on a representative component is not currently available. In some cases a part number has been assigned by the design but the data sheet is not yet available due to a lack of information from the vendor or the data is not yet installed in the database. This information will be added to the databook as it becomes available. An index of the individual detailed data sheets is shown in Table 2.4-1, while the individual data sheets are compiled in Appendix A.

TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	VENDOR	VENDOR PART NUMBER
1	30	USL, PFS	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	48	USL, PWH	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	196	IWFS, LABS	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	197	IWFS, ECLSS	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	198	IWFS, ATT PAYL	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	199	IWFS, INS	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
	200	IWFS, INS	DISCONNECT.	SYMETRICS INC.	502040-1011 & -3012
2	11	USL, PFS	DISCONNECT.	PTI TECHNOLOGIES, INC.	7537191-4
3	33	USL, PFS	DISCONNECT.	SYMETRICS INC.	592002-3 & -4
	58	USL, PWH	DISCONNECT.	SYMETRICS INC.	592002-3 & -4
	195	IWFS.	DISCONNECT.	SYMETRICS INC.	592002-3 & -4
4	37	USL, PWH	DISCONNECT.	TBD	TBD
5	149	SEHT.	DISCONNECT.	TBD	TBD
6	3	USL, VVS	DISCONNECT.	TBD	TBD
	64	USL, PWH	DISCONNECT.	TBD	TBD
7	217	INS.	DISCONNECT.	TBD	TBD
8	125	INS, RS	DISCONNECT.	TBD	TBD
	134	INS, SS	DISCONNECT.	TBD	TBD
	142	INS, DS	DISCONNECT.	TBD	TBD
9	150	SEHT.	DISCONNECT, EMERGENCY	TBD	TBD
10	54	USL, PWH	ENGINE, BURNER, CATALYTIC	TBD	TBD
11	92	ECLSS, AR	FILTER, AVIONICS PARTICULATE	TBD	TBD
12	95	ECLSS, AR	FILTER, BACTERIA/PARTICULATE	TBD	TBD
13	14	USL, PFS	FILTER, INLINE	TBD	TBD
14	194	IWFS.	FILTER, INLINE	TBD	TBD
15	215	INS.	FILTER, INLINE	TBD	TBD
16	124	INS, RS	FILTER, INLINE	TBD	TBD
	133	INS, SS	FILTER, INLINE	TBD	TBD
	141	INS, DS	FILTER, INLINE	TBD	TBD
17	39	USL, PWH	FILTER, INLINE	TBD	TBD
18	73	USL, PWH	FILTER, MULTIPLE	TBD	TBD
19	116	ECLSS, WH	MISC, BRINE STORAGE	TBD	TBD
20	160	SEHT.	MISC, BURST DISK	TBD	TBD
21	91	ECLSS, THC	MISC, CABIN COOLING PKG	TBD	TBD
22	99	ECLSS, AR	MISC, CATALYTIC OXIDIZER	TBD	TBD
23	94	ECLSS, AR	MISC, CO2 REDUCTION, BOSCH	TBD	TBD
24	207	IWFS.	MISC, COMPRESSOR	TBD	TBD
25	206	IWFS.	MISC, COMPRESSOR	TBD	TBD
26	67	USL, PWH	MISC, COMPRESSOR, REFRIGERATION	TBD	TBD

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TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX (CONTINUED)

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	VENDOR	VENDOR PART NUMBER
27	115	ECLSS, ACS	MISC, CONTROL, N2 RESUPPLY PRESSURE	TBD	TBD
28	101	ECLSS, FDS	MISC, CONTROLLER, PYRO	TBD	TBD
29	59	USL, PMH	MISC, CRYO UNIT, LN2 PRODUCTION	TBD	TBD
30	40	USL, PMH	MISC, DIFFUSER, SUCTION	TBD	TBD
31	103	ECLSS, WRH	MISC, DISPENSER, POTABLE WATER	TBD	TBD
32	97	ECLSS, AR	MISC, ELECTROLYSIS UNIT, KOH	TBD	TBD
33	109	ECLSS, WRH	MISC, EYEWASH	TBD	TBD
34	117	ECLSS, WH	MISC, FECAL STORAGE	TBD	TBD
35	35	USL, PFS	MISC, FLEX HOSE	TBD	TBD
36	7	USL, PFS	MISC, FLEX HOSE	TBD	TBD
37	12	USL, PFS	MISC, FLEX HOSE	TBD	TBD
38	72	USL, PMH	MISC, FLEX HOSE	TBD	TBD
39	151	SFHT,	MISC, FLEX HOSE	TBD	TBD
40	84	USL, PMH	MISC, FLEX HOSE, TEFLON LINED	TBD	TBD
41	78	USL, PMH	MISC, FLEX HOSE, TEFLON LINED	TBD	TBD
42	50	USL, PMH	MISC, FLEX HOSE, TEFLON LINED	TBD	TBD
43	69	USL, PMH	MISC, FLEX HOSE, TEFLON LINED	TBD	TBD
44	169	SFHT,	MISC, HEAT EXCHANGER	TBD	TBD
45	216	IWS,	MISC, HEATER	TBD	TBD
46	96	ECLSS, AR	MISC, MOLECULAR SIEVE, 4-BED	TBD	TBD
47	98	ECLSS, AR	MISC, MONITOR, ATMOSPHERE	TBD	TBD
48	106	ECLSS, WRH	MISC, MONITOR, WATER QUALITY	TBD	TBD
49	167	SFHT,	MISC, POROUS PLUG	TBD	TBD
50	168	SFHT,	MISC, POROUS PLUG	TBD	TBD
51	89	ECLSS, ACS	MISC, PRESSURE CONTROL SYSTEM	TBD	TBD
52	77	USL, PMH	MISC, PRETREATMENT UNIT, WASTE	TBD	TBD
53	108	ECLSS, WRH	MISC, PROCESSING UNIT, POTABLE WATER	TBD	TBD
54	107	ECLSS, WRH	MISC, PROCESSING UNIT, WASTE HYGIENE	TBD	TBD
55	23	USL, PFS	MISC, PUMP	TBD	TBD
56	70	USL, PMH	MISC, PUMP	TBD	TBD
57	208	IWS,	MISC, PUMP	TBD	TBD
58	164	SFHT,	MISC, PUMP, FEP	TBD	TBD
59	165	SFHT,	MISC, PUMP, VACUUM	TBD	TBD
60	57	USL, PMH	MISC, PUMP, VACUUM	TBD	TBD

TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX (CONTINUED)

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	VENDOR	VENDOR PART NUMBER
61	166	SFHT.	MISC. PUMP, VACUUM GAGE ION	TBD	TBD
62	113	ECLSS, ACS	MISC. REFRIGERATOR/FREEZER	TBD	TBD
63	45	USL, PMH	MISC. SEPARATOR, GAS/LIQUID	TBD	TBD
64	93	ECLSS, AR	MISC. SORBENT BED	TBD	TBD
65	61	USL, PMH	MISC. TIMES UNIT	HAMILTON STANDARD	TBD
66	81	USL, PMH	MISC. VACUUM UNIT, PORTABLE	TBD	TBD
67	162	SFHT.	MISC. VENT ASSY. NON-PROPULSIVE	TBD	TBD
68	161	SFHT.	MISC. VENT ASSY. NON-PROPULSIVE	TBD	TBD
69	163	SFHT.	MISC. VENT ASSY. NON-PROPULSIVE	TBD	TBD
70	123	INS, RS	MISC. VENT ASSY. NON-PROPULSIVE	TBD	TBD
	132	INS, SS	MISC. VENT ASSY. NON-PROPULSIVE	TBD	TBD
71	16	USL, PFS	MISC. WATER PROCESSOR	TBD	TBD
72	203	IWFS.	PRESSURE VESSEL.	TBD	TBD
73	202	IWFS.	PRESSURE VESSEL.	TBD	TBD
74	27	USL, PFS	PRESSURE VESSEL.	TBD	TBD
75	28	USL, PFS	PRESSURE VESSEL.	TBD	TBD
76	19	USL, PFS	PRESSURE VESSEL.	TBD	TBD
77	65	USL, PMH	PRESSURE VESSEL.	TBD	TBD
78	201	IWFS.	PRESSURE VESSEL.	TBD	TBD
79	51	USL, PMH	PRESSURE VESSEL.	TBD	TBD
80	218	IWS.	PRESSURE VESSEL.	TBD	TBD
81	118	INS, RS	PRESSURE VESSEL.	TBD	TBD
82	128	INS, SS	PRESSURE VESSEL.	TBD	TBD
83	114	ECLSS, ACS	PRESSURE VESSEL.	TBD	TBD
84	205	IWFS.	PRESSURE VESSEL, ACCUMULATORS	TBD	TBD
85	56	IWFS.	PRESSURE VESSEL, ACCUMULATORS	TBD	TBD
	204	IWFS.	PRESSURE VESSEL, ACCUMULATORS	TBD	TBD
86	105	ECLSS, WRM	PRESSURE VESSEL, CONDENSATE WATER	TBD	TBD
87	104	ECLSS, WRM	PRESSURE VESSEL, EMERGENCY WASH WATER	TBD	TBD
88	100	ECLSS, FDS	PRESSURE VESSEL, FIRE SUPPRESSANT	TBD	TBD
89	112	ECLSS, WRM	PRESSURE VESSEL, HYGIENE WATER	TBD	TBD
90	147	SFHT.	PRESSURE VESSEL, ISOGRID	TBD	TBD
91	44	USL, PMH	PRESSURE VESSEL, LIQUID WASTE	TBD	TBD
92	75	USL, PMH	PRESSURE VESSEL, MATERIAL TRANS. CONT.	TBD	TBD
93	29	USL, PFS	PRESSURE VESSEL, PORTABLE	TBD	TBD

TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX (CONTINUED)

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	VENDOR	VENDOR PART NUMBER
94	102	ECLSS, WRM	PRESSURE VESSEL, POTABLE WATER	TBD	TBD
95	15	USL, PFS	PRESSURE VESSEL, PROCESS WATER	TBD	TBD
96	110	ECLSS, WRM	PRESSURE VESSEL, PROCESSED HYGIENE WATER	TBD	TBD
97	148	SPHT,	PRESSURE VESSEL, STIFFENED MONOCOQUE	TBD	TBD
98	21	USL, PFS	PRESSURE VESSEL, STORAGE CONT.	TBD	TBD
99	42	USL, PMH	PRESSURE VESSEL, WASTE CONTAINMENT	TBD	TBD
100	55	USL, PMH	PRESSURE VESSEL, WASTE GAS	TBD	TBD
101	68	USL, PMH	PRESSURE VESSEL, WASTE HOLDING	TBD	TBD
102	111	ECLSS, WRM	PRESSURE VESSEL, WASTE HYGIENE WATER	TBD	TBD
103	189	IMFS,	REGULATOR, DOWNSTREAM	EATON CONSOLIDATED CONTROL	13890 MODIFIED
	190	IMFS,	REGULATOR, DOWNSTREAM	EATON CONSOLIDATED CONTROL	13890 MODIFIED
104	191	IMFS,	REGULATOR, DOWNSTREAM	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED
	212	IMS,	REGULATOR, DOWNSTREAM	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED
105	24	USL, PFS	REGULATOR, DOWNSTREAM	FUTURECRAFT CORP.	400236 MODIFIED
106	87	ECLSS, ACS	REGULATOR, DOWNSTREAM	TBD	TBD
107	43	USL, PMH	REGULATOR, DOWNSTREAM	TBD	TBD
108	143	IMS, DS	REGULATOR, ELECTRONIC, W/RELIEF	TBD	TBD
109	13	USL, PFS	SENSOR, FLOW METER	TBD	TBD
110	41	USL, PMH	SENSOR, FLOW METER	TBD	TBD
111	174	SPHT,	SENSOR, FLOW METER, GAS	TBD	TBD
112	173	SPHT,	SENSOR, FLOW METER, LIQUID	TBD	TBD
113	172	SPHT,	SENSOR, MASS METER	TBD	TBD
114	170	SPHT,	SENSOR, PRESSURE	TBD	TBD
115	1	USL, VVS	SENSOR, PRESSURE	TBD	TBD
116	47	USL, PMH	SENSOR, PRESSURE	KULITE SEMICONDUCTOR PRODU	BMDE-1100-10
117	193	IMFS,	SENSOR, PRESSURE	MOOG, CARLETON GROOP	2731-0001-5
	213	IMS,	SENSOR, PRESSURE	MOOG, CARLETON GROOP	2731-0001-5
118	192	IMFS,	SENSOR, PRESSURE	TELEDYNE TABER	2403-200
119	145	IMS, DS	SENSOR, PRESSURE	IMO DELAVAL INC., CEC INST	615505 MODIFIED
120	18	USL, PFS	SENSOR, PRESSURE	STATHAM DIVISION, SOLARTRO	C29284/A MODIFIED
121	126	IMS, RS	SENSOR, PRESSURE	EATON CONSOLIDATED CONTROL	41SG197-2000A1 MOD.
	135	IMS, SS	SENSOR, PRESSURE	EATON CONSOLIDATED CONTROL	41SG197-2000A1 MOD.
	144	IMS, DS	SENSOR, PRESSURE	EATON CONSOLIDATED CONTROL	41SG197-2000A1 MOD.
122	66	USL, PMH	SENSOR, PRESSURE	TBD	TBD
123	22	USL, PFS	SENSOR, DELTA PRESSURE	TBD	TBD
124	25	USL, PFS	SENSOR, QUALITY METER	TBD	TBD

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TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX (CONTINUED)

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE		VENDOR	VENDOR PART NUMBER
125	60	USL, PWH	SENSOR, QUALITY MONITOR		TBD	TBD
126	171	SFHT,	SENSOR, TEMPERATURE		TBD	TBD
127	214	INS,	SENSOR, TEMPERATURE		TBD	TBD
128	146	INS, DS	SENSOR, TEMPERATURE		TBD	TBD
129	6	USL, PFS	SENSOR, TEMPERATURE		TBD	TBD
130	127	INS, RS	SENSOR, TEMPERATURE		TBD	TBD
	136	INS, SS	SENSOR, TEMPERATURE		TBD	TBD
131	49	USL, PWH	SENSOR, TEMPERATURE		TBD	TBD
132	62	USL, PWH	SENSOR, TEMPERATURE		TBD	TBD
133	188	IWFS,	VALVE, CHECK		VACCO INDUSTRIES	V1D10746-01
	211	INS,	VALVE, CHECK		VACCO INDUSTRIES	V1D10746-01
134	187	IWFS,	VALVE, CHECK		VACCO INDUSTRIES	4573779
135	10	USL, PFS	VALVE, CHECK		CIRCLE SEAL CONTROLS	CZ77A-4Q
136	36	USL, PWH	VALVE, CHECK		TBD	TBD
137	17	USL, PFS	VALVE, CHECK		TBD	TBD
138	71	USL, PWH	VALVE, CHECK		TBD	TBD
139	186	IWFS,	VALVE, CHECK		MANOTTA SCIENTIFIC CONTROL	806232
140	176	IWFS,	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15983-1
141	180	IWFS,	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15613
142	34	USL, PFS	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15611-2
	178	IWFS,	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15611-2
143	177	IWFS,	VALVE, ELECTRIC		MOOG, SPACE PRODUCTS DIVIS	53-159
144	179	IWFS,	VALVE, ELECTRIC		TBD	TBD
145	9	USL, PFS	VALVE, ELECTRIC		AMETEK, STRAZA DIVISION	435
146	175	IWFS,	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15751
147	32	USL, PFS	VALVE, ELECTRIC		MOOG, SPACE PRODUCTS DIVIS	52-178
148	181	IWFS,	VALVE, ELECTRIC		WRIGHT COMPONENTS INC.	15975
149	38	USL, PWH	VALVE, ELECTRIC		AMETEK, STRAZA DIVISION	525-503
150	4	USL, VVS	VALVE, ELECTRIC		TBD	TBD
151	209	IWS,	VALVE, ELECTRIC		TBD	TBD
152	63	USL, PWH	VALVE, ELECTRIC		TBD	TBD
153	90	ECISS, ACS	VALVE, EQUALIZATION		TBD	TBD
154	20	USL, PFS	VALVE, FLOW RESTRICTOR		TBD	TBD
155	8	USL, PFS	VALVE, FLOW RESTRICTOR		TBD	TBD
156	119	INS, RS	VALVE, MANUAL, SERVICE		VACCO INDUSTRIES	V1E10330-01

TABLE 2.4-1 FLUID SYSTEM HARDWARE INDIVIDUAL DATA SHEET INDEX (CONTINUED)

SHEET NO.	ITEM NO.	PROGRAM APPLICATION	COMPONENT TYPE	VENDOR	VENDOR PART NUMBER
157	155	SFHT.	VALVE, MANUAL, SHUT-OFF	TBD	TBD
158	2	USL, VVS	VALVE, MANUAL, SHUT-OFF	TBD	TBD
159	5	USL, VVS	VALVE, MANUAL, SHUT-OFF	TBD	TBD
160	88	ECLSS, ACS	VALVE, RELIEF	TBD	TBD
161	185	INFS.	VALVE, RELIEF	TBD	TBD
	210	INS.	VALVE, RELIEF	TBD	TBD
162	183	INFS.	VALVE, RELIEF	TBD	TBD
163	52	USL, PWH	VALVE, RELIEF	TBD	TBD
164	182	INFS.	VALVE, RELIEF	TBD	TBD
165	158	SFHT.	VALVE, RELIEF	TBD	TBD
166	159	SFHT.	VALVE, RELIEF	TBD	TBD
167	53	USL, PWH	VALVE, RELIEF	TBD	TBD
168	122	INS, RS	VALVE, RELIEF W/BD	TBD	TBD
	131	INS, SS	VALVE, RELIEF W/BD	TBD	TBD
169	157	SFHT.	VALVE, SEAL-OFF, VACUUM	TBD	TBD
170	156	SFHT.	VALVE, SEAL-OFF, VACUUM	TBD	TBD
171	154	SFHT.	VALVE, SOLENOID, LATCHING	TBD	TBD
172	120	INS, RS	VALVE, SOLENOID, LATCHING	TBD	TBD
	129	INS, SS	VALVE, SOLENOID, LATCHING	TBD	TBD
	139	INS, DS	VALVE, SOLENOID, LATCHING	TBD	TBD
173	140	INS, DS	VALVE, SOLENOID, LATCHING	TBD	TBD
174	152	SFHT.	VALVE, SOLENOID, LATCHING W/BPR	TBD	TBD
175	153	SFHT.	VALVE, SOLENOID, LATCHING W/BPR	TBD	TBD
176	121	INS, RS	VALVE, TORQUE MOTOR	TBD	TBD
	130	INS, SS	VALVE, TORQUE MOTOR	TBD	TBD
	137	INS, DS	VALVE, TORQUE MOTOR	TBD	TBD
177	138	INS, DS	VALVE, TORQUE MOTOR	TBD	TBD
178	74	USL, PWH	VALVE, VENT ASSY	TBD	TBD

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2.5 FLUID SYSTEM HARDWARE TECHNOLOGY ASSESSMENT

All hardware listed in the previous sections was reviewed to determine technology status. This review indicated that most items are flight proven or flight qualified hardware. However, several items were identified that require various levels of technological development ranging from flight qualification testing to items which have not yet even been demonstrated in a laboratory environment. Table 2.5-1 lists these items and defines their current state of development.

Table 2.5-1 Fluid System Hardware Technology Assessment

HARDWARE SHEET NO.	COMPONENT		PROGRAM APPLICATION	STATE OF DEVEL.	GENERAL COMMENTS
	TYPE	SUB-TYPE			
5	Disconnected		SFHT	3	Moog Space Products has a development design which has been tested as a prototype.
9	Disconnected	Emergency	SFHT	1	Currently only at preliminary definition stage.
23	Miscellaneous	CO2 Reduction, Bosch	ECLSS, AR	5	Prototype unit has only been laboratory tested.
24	Miscellaneous	Compressor	WFS	1	No design currently available to compress hydrogen and meet high life limits.
25	Miscellaneous	Compressor	WFS	3	OLOGS compressor modified to meet the life reqt needs to be tested.
32	Miscellaneous	Electrolysis Unit	ECLSS, AR	5	Prototype unit has only been laboratory tested.
46	Miscellaneous	Molecular Sieve, 4 Bed	ECLSS, AR	5	Prototype unit has only been laboratory tested.
49	Miscellaneous	Porous Plug	SFHT	1	Has never been demonstrated for this application.
50	Miscellaneous	Porous Plug	SFHT	1	Has never been demonstrated for this application.
58	Miscellaneous	Pump, FEP	SFHT	1	Has never been demonstrated for this application.
65	Miscellaneous	TIMES Unit	USL, PWH	5	Prototype unit has only been laboratory tested.
90	Miscellaneous	Pressure Vessel, Isogrid	SFHT	1	Has never been demonstrated for this application.
97	Miscellaneous	Pressure Vessel, Stiffened Monocoque	SFHT	4	Has never been demonstrated for this application.

State of Devel. Value	State of Development Value Definitions	
	Value	Definition
1	Basic Principles Observed and Reported	
2	Conceptual Design Formulated	
3	Conceptual Design Tested	
4	Critical Hardware Tested	
5	Preprototype Tested	
6	Prototype Tested	
7	Engineering Model Tested	
8	Operational	

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2.6 FLUID SYSTEM HARDWARE COMMONALITY ASSESSMENT

Fluid system hardware commonality if pursued to the maximum extent, can provide the lowest life cycle cost system, by insuring the lowest component unit cost, the lowest piece part spares requirements and a more standard repair procedure in the event of a failure.

Hardware commonality for the fluid systems was first assessed by performing multiple sorts on the data shown in the first four sections. Sorting was done by component type, subtype and port size. The fluid media, pressure and weight were then compared to identify a range which could reasonable be lumped together. Table 2.6-1 lists the maximum extent of commonality which is practical given the data used to define the fluid systems discussed in EP 2.1 Space Station Program Fluid Inventory Databook.

Further fluid system hardware commonality should be considered at this time, however, in that the design of most systems can still be impacted with little or no penalty to the system designs. Several hardware items should be considered for use as a standard design item to insure the maximum practicable commonality. Items which could be considered are disconnects, pressure vessels, electrolysis units, compressors, pumps and water treatment units.

With the number of disconnects required and the type of service required, it would be beneficial to assemble the worst case design requirements and design a single disconnect that would meet all the Space Station needs. Another hardware item which should be considered for a common design approach is the gaseous pressure vessel. There are a number of gaseous pressure vessels used in the IWFS, INS, USL, JEM, Columbus and the Habitation Module that by adjusting the gas requirements, perhaps a single pressure vessel design could be used for multiple applications. The electrolysis units (EU's) could be of a common design by adjusting design requirements to allow for the same EU in both propulsion and the ECLSS applications. The same logic applies to the compressors, pumps and water treatment units and will be discussed in detail in EP 2.4 Space Station Fluid Management Systems Databook.

Table 2.6-1 FLUID SYSTEM HARDWARE COMMONALITY ASSESSMENT

COMPONENT TYPE	SUBTYPE	SHEET NUMBER	PORT SIZE (INCH)	APPROX. MASS (LB)	VENDOR	VENDOR PART NUMBER	ITEM NO.	QUANTITY REQUIRED	PROGRAM APPLICATION	USAGE (MEDIA)	REOP (PSIA)
DISCONNECT		1	.25	0.8	SYNTECH INC.	502040-1011 & -3012	30	44	USL	H2O	100
							48	7	USL	ALL	14.7
							196	12	IMFS	REDUCERS	15
							197	2	IMFS	REDUCERS	180
							198	2	IMFS	REDUCERS	800
DISCONNECT							199	16	IMFS	H2O	30
							200	4	IMFS	GN2	750
		3	.315	0.4	SYNTECH INC.	582002-3 & -4	33	36	USL	H2O	100
							58	17	USL	ALL	14.7
							195	16	IMFS	OXIDIZERS	15
DISCONNECT		6	2.0	1.8	TBD	TBD	3	22	USL	ALL	.25 (TUBER)
							64	10	USL	ALL	14.7
DISCONNECT		8	TBD	TBD	TBD	TBD	125	4	INS	GN2	4000
							134	8	INS	GN2	4000
							142	4	INS	GN2	4000
FILTER	INLINE	16	TBD	TBD	TBD	TBD	124	4	INS	GN2	4000
							133	8	INS	GN2	4000
							141	4	INS	GN2	4000
MISC	VENT ASST. NON-PROPULSIVE	70	TBD	TBD	TBD	TBD	123	12	INS	GN2	4000
							132	6	INS	GN2	4000
PRESSURE VESSEL	ACCUMULATORS	85	.25/.5	0.3	TBD	TBD	56	2	IMFS	OXIDIZERS	35
							204	2	IMFS	REDUCERS	35
REGULATOR	DOWNSTREAM	103	.25	0.3	EATON CONSOLIDATED CONTROLS CORP.	13890 MODIFIED	189	2	IMFS	REDUCERS	300/75
							190	2	IMFS	OXIDIZERS	300/75
REGULATOR	DOWNSTREAM	104	.25	0.6	AERODYNE CONTROLS CORP.	3066-5-000 MODIFIED	191	6	IMFS	GN2	750/30
							212	4	INS	GN2	750/30
SENSOR	PRESSURE	117	.25	0.5	MOOG, CARLITON GROUP	2731-0001-5	193	14	IMFS	H2O	30
							213	28	INS	H2O	30
SENSOR	PRESSURE	121	.25	0.6	EATON CONSOLIDATED CONTROLS CORP.	4136197-2000A1 MOD.	126	16	INS	GN2	4000
							135	10	INS	GN2	4000
							144	2	INS	GN2	4000

TABLE 2.6-1 FLUID SYSTEM HARDWARE COMMONALITY ASSESSMENT (CONTINUED)

COMPONENT TYPE	SUBTYPE	SHEET NUMBER	PORT SIZE (INCH)	APPROX. MASS (LB)	VENDOR	VENDOR PART NUMBER	ITEM NO.	QUANTITY (REQUIRED)	PROGRAM APPLICATION	USAGE (MEDIA)	MDP (PSIA)
SENSOR	TEMPERATURE	130	.25	0.2	TBD		127	12	INS	GN2	4000
							136	6	INS	GN2	4000
VALVE	CHECK	133	.25	0.5	VACCO INDUSTRIES	VID10746-01	188	8	INS	H2O	30
							211	6	INS	H2O	30
VALVE	ELECTRIC	142	.25	0.5	WRIGHT COMPONENTS INC.	15611-2	34	36	USL	GHE, AIR	50
							178	6	INS	GN2	30
VALVE	RELIEF	161	.25	1.0	TBD		185	1	INS	H2O	30
							210	8	INS	H2O	30
VALVE	RELIEF W/NO	168	.25	TBD	TBD		122	12	INS	GN2	4000
							131	6	INS	GN2	4000
VALVE	SOLENOID, LATCHING	172	.25	1.6	TBD		120	24	INS	GN2	4000
							129	12	INS	GN2	4000
							139	3	INS	GN2	4000
VALVE	TORQUE MOTOR	176	.25	1.6	TBD		121	4	INS	GN2	4000
							130	8	INS	GN2	4000
							137	4	INS	GN2	4000

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APPENDIX A

This appendix contains individual component data sheets as they are currently available in Martin Marietta's propulsion component database. Sheet numbers not contained here are not currently available.

DISCONNECT DATA REPORT / DATA ENTRY DATE: 07/21/87

TYPE.....	MANUAL
SUBTYPE.....	FEMALE HALF
VENDOR.....	065, SYMETRICS INC.
VENDOR PART NUMBER.....	502040-1011
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	ORBITER
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4,-7,15-5,6061-T6
SEAL MATERIAL.....	RACO 321/302
OPERATING PRESSURE (PSIG).....	1050.00
PROOF PRESSURE (PSIG).....	1575.00
BURST PRESSURE (PSIG).....	2100.00
MAXIMUM TEMPERATURE LIMIT (F).....	160.000
MINIMUM TEMPERATURE LIMIT (F).....	-23.0000
THERMAL CYCLES (CYCLES).....	5.00000
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
PRESSURE DROP (PSID).....	19.0000
FLOW RATE.....	50 LBM/HR O2
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
CONNECTED LEAKAGE.....	1.0E-5 SCCS HE
DISCONNECTED LEAKAGE.....	1.0E-5 SCCS HE
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	29.4000
VIBRATION DURATION (MIN/AXIS).....	48.0000
SHOCK LIMITS (G's).....	25.0000
METHOD OF ACTUATION.....	MANUAL
CONNECT FORCE (LBF).....	-0-
DISCONNECT FORCE (LBF).....	-0-
CONNECT TORQUE (IN*LBF).....	30.0000
DISCONNECT TORQUE (IN*LBF).....	30.0000
WEIGHT (LBF).....	0.24000
OFFSET (IN).....	-0-
MISALIGNMENT (DEG).....	-0-
LIFETIME (YEARS).....	20.0000
CYCLE LIFE (CYCLES).....	1000.00
MTBF (HOURS).....	125000.
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	07
ENVELOPE.....	3.16 IN X 1.25 IN DIA (APPROX)
COMMENTS.....	MATES-P/N 502040-3012, DISCON LKG VOL=0.12 SCC, 2-STAGE OPERATIO

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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COMPONENT DATA SHEET 1B

DISCONNECT DATA REPORT / DATA ENTRY DATE: 07/21/87

TYPE.....	MANUAL
SUBTYPE.....	MALE HALF
VENDOR.....	065, SYMETRICS INC.
VENDOR PART NUMBER.....	502040-3012
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	ORBITER
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4,-7,15-5,6061-T6
SEAL MATERIAL.....	RACO 321/302
OPERATING PRESSURE (PSIG).....	1050.00
PROOF PRESSURE (PSIG).....	1575.00
BURST PRESSURE (PSIG).....	2100.00
MAXIMUM TEMPERATURE LIMIT (F).....	160.000
MINIMUM TEMPERATURE LIMIT (F).....	-23.0000
THERMAL CYCLES (CYCLES).....	5.00000
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
PRESSURE DROP (PSID).....	19.0000
FLOW RATE.....	50 LBM/HR O2
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
CONNECTED LEAKAGE.....	1.0E-5 SCCS HE
DISCONNECTED LEAKAGE.....	1.0E-5 SCCS HE
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	29.4000
VIBRATION DURATION (MIN/AXIS).....	48.0000
SHOCK LIMITS (G's).....	25.0000
METHOD OF ACTUATION.....	MANUAL
CONNECT FORCE (LBF).....	-0-
DISCONNECT FORCE (LBF).....	-0-
CONNECT TORQUE (IN*LBF).....	30.0000
DISCONNECT TORQUE (IN*LBF).....	30.0000
WEIGHT (LBF).....	0.58000
OFFSET (IN).....	-0-
MISALIGNMENT (DEG).....	-0-
LIFETIME (YEARS).....	20.0000
CYCLE LIFE (CYCLES).....	1000.00
MTBF (HOURS).....	125000.
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	07
ENVELOPE.....	1.26 IN X 0.87 IN DIA (APPROX)
COMMENTS.....	MATES-P/N 502040-1011, DISCON LKG VOL=0.12 SCC, 2-STAGE OPERATIO

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

DISCONNECT DATA REPORT / DATA ENTRY DATE: 08/12/87

TYPE.....	MANUAL
SUBTYPE.....	BOTH HALVES
VENDOR.....	045, PTI TECHNOLOGIES INC.
VENDOR PART NUMBER.....	7537191-4
MARTIN MARIETTA PART NUMBER.....	PD45S0140
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	MACE - HYD. SERVICE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	SEE DRAWING
SEAL MATERIAL.....	SEE DRAWING
OPERATING PRESSURE (PSIG).....	3000.00
PROOF PRESSURE (PSIG).....	4500.00
BURST PRESSURE (PSIG).....	6000.00
MAXIMUM TEMPERATURE LIMIT (F).....	160.000
MINIMUM TEMPERATURE LIMIT (F).....	-35.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	-0-
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
CONNECTED LEAKAGE.....	-0-
DISCONNECTED LEAKAGE.....	-0-
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	-0-
CONNECT FORCE (LBF).....	-0-
DISCONNECT FORCE (LBF).....	-0-
CONNECT TORQUE (IN*LBF).....	-0-
DISCONNECT TORQUE (IN*LBF).....	-0-
WEIGHT (LBF).....	-0-
OFFSET (IN).....	-0-
MISALIGNMENT (DEG).....	-0-
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	28
COMPATIBLE FLUIDS.....	28
ENVELOPE.....	SEE DRAWING
COMMENTS.....	-0-

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PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

DISCONNECT DATA REPORT / DATA ENTRY DATE: 07/21/87

TYPE.....	MANUAL
SUBTYPE.....	MALE HALF
VENDOR.....	065, SYMETRICS INC.
VENDOR PART NUMBER.....	592002-3
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	ORBITER
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4, 17-7, 316
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	100.000
PROOF PRESSURE (PSIG).....	200.000
BURST PRESSURE (PSIG).....	400.000
MAXIMUM TEMPERATURE LIMIT (F).....	360.000
MINIMUM TEMPERATURE LIMIT (F).....	-65.0000
THERMAL CYCLES (CYCLES).....	5.00000
CYCLE TEMPERATURES (RANGE,F).....	-65 TO 275
INLET PORT SIZE (IN).....	0.37500
OUTLET PORT SIZE (IN).....	-0-
PRESSURE DROP (PSID).....	4.00000
FLOW RATE.....	2.0 GPM
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
CONNECTED LEAKAGE.....	1.0E-4 SCCS HE
DISCONNECTED LEAKAGE.....	1.0E-4 SCCS HE
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	29.4000
VIBRATION DURATION (MIN/AXIS).....	48.0000
SHOCK LIMITS (G's).....	25.0000
METHOD OF ACTUATION.....	MANUAL
CONNECT FORCE (LBF).....	30.0000
DISCONNECT FORCE (LBF).....	30.0000
CONNECT TORQUE (IN*LBF).....	-0-
DISCONNECT TORQUE (IN*LBF).....	-0-
WEIGHT (LBF).....	0.16000
OFFSET (IN).....	-0-
MISALIGNMENT (DEG).....	-0-
LIFETIME (YEARS).....	20.0000
CYCLE LIFE (CYCLES).....	500.000
MTBF (HOURS).....	117000.
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	1.19 IN X 0.94 IN DIA (APPROX)
COMMENTS.....	MATES-P/N 592002-4, HYDRL FLUIDS, PSIG=PSI, DISCON LKG VOL=0.02 SC
PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

DISCONNECT DATA REPORT / DATA ENTRY DATE: 07/21/87

TYPE.....	MANUAL
SUBTYPE.....	FEMALE HALF
VENDOR.....	065, SYMETRICS INC.
VENDOR PART NUMBER.....	592002-4
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	ORBITER
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4, 17-7, 316
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	100.000
PROOF PRESSURE (PSIG).....	200.000
BURST PRESSURE (PSIG).....	400.000
MAXIMUM TEMPERATURE LIMIT (F).....	360.000
MINIMUM TEMPERATURE LIMIT (F).....	-65.0000
THERMAL CYCLES (CYCLES).....	5.00000
CYCLE TEMPERATURES (RANGE,F).....	-65 TO 275
INLET PORT SIZE (IN).....	0.37500
OUTLET PORT SIZE (IN).....	-0-
PRESSURE DROP (PSID).....	4.00000
FLOW RATE.....	2.0 GPM
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
CONNECTED LEAKAGE.....	1.0E-4 SCCS HE
DISCONNECTED LEAKAGE.....	1.0E-4 SCCS HE
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	29.4000
VIBRATION DURATION (MIN/AXIS).....	48.0000
SHOCK LIMITS (G's).....	25.0000
METHOD OF ACTUATION.....	MANUAL
CONNECT FORCE (LBF).....	30.0000
DISCONNECT FORCE (LBF).....	30.0000
CONNECT TORQUE (IN*LBF).....	-0-
DISCONNECT TORQUE (IN*LBF).....	-0-
WEIGHT (LBF).....	0.18000
OFFSET (IN).....	-0-
MISALIGNMENT (DEG).....	-0-
LIFETIME (YEARS).....	20.0000
CYCLE LIFE (CYCLES).....	500.000
MTBF (HOURS).....	117000.
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	1.42 IN X 1.06 IN DIA (APPROX)
COMMENTS.....	MATES-P/N 592002-3, HYDRL FLUIDS, PSIG=PSI, DISCON LKG VOL=0.02 SC
PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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COMPONENT DATA SHEET 103

PRESSURE REGULATOR DATA REPORT / DATA ENTRY DATE: 08/11/87

TYPE.....	MECHANICAL
SUBTYPE (INLET OR OUTLET REGULATION).....	OUTLET
MANUFACTURER.....	014, EATON CONSOLIDATED CONTROLS
MANUFACTURER'S PART NUMBER.....	13890 MODIFIED
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	AEROBEE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	2024-T351 ALUM
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	KEL-F
UPPER INLET OPERATING PRESSURE (PSIA).....	515.000
LOWER INLET OPERATING PRESSURE (PSIA).....	190.000
UPPER OUTLET OPERATING PRESSURE (PSIA).....	40.0000 MOD TO 75.00
LOWER OUTLET OPERATING PRESSURE (PSIA).....	40.0000 MOD TO 75.00
INLET PROOF PRESSURE (PSIG).....	1015.00
OUTLET PROOF PRESSURE (PSIG).....	1015.00
INLET BURST PRESSURE (PSIG).....	1515.00
OUTLET BURST PRESSURE (PSIG).....	1515.00
MAXIMUM OPERATING TEMPERATURE (F).....	160.000
MINIMUM OPERATING TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	0.17 SCFM @ 40 PSI
PRESSURE DROP TEST FLUID.....	N2
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	-0-
EXTERNAL LEAKAGE.....	0.0
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION TIME (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
REGULATION ACCURACY (%).....	-0-
WEIGHT (LBF).....	0.30000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	100000.
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	04
ENVELOPE.....	1.56 IN X 2.00 IN X 5.19 IN
COMMENTS.....	PSIA = PSIG, PORTS- AND 10050, SPRING BALANCED

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

PRESSURE REGULATOR DATA REPORT / DATA ENTRY DATE: 03/05/87

TYPE..... MECHANICAL
SUBTYPE (INLET OR OUTLET REGULATION)..... OUTLET
MANUFACTURER..... 001, AERODYNE CONTROLS CORPORATION
MANUFACTURER'S PART NUMBER..... 3066-5-000 MODIFIED
MARTIN MARIETTA PART NUMBER..... -0-
QUALIFICATION STATUS..... CURRENT
PAST APPLICATIONS..... AWACS
PRINCIPAL MATERIAL OF CONSTRUCTION..... ALLUMINUM ALLOY
SEAL MATERIAL..... BUTYL
SEAT MATERIAL..... -0-
UPPER INLET OPERATING PRESSURE (PSIA)..... 850.000
LOWER INLET OPERATING PRESSURE (PSIA)..... 60.0000
UPPER OUTLET OPERATING PRESSURE (PSIA)..... 19.5000 MOD TO 30.00
LOWER OUTLET OPERATING PRESSURE (PSIA)..... -0-
INLET PROOF PRESSURE (PSIG)..... 1500.00
OUTLET PROOF PRESSURE (PSIG)..... 750.000
INLET BURST PRESSURE (PSIG)..... 3000.00
OUTLET BURST PRESSURE (PSIG)..... 1000.00
MAXIMUM OPERATING TEMPERATURE (F)..... 160.000
MINIMUM OPERATING TEMPERATURE (F)..... -65.0000
THERMAL CYCLES (CYCLES)..... -0-
CYCLE TEMPERATURES (RANGE,F)..... -0-
INLET PORT SIZE (IN)..... 0.25000
OUTLET PORT SIZE (IN)..... 0.25000
PRESSURE DROP (PSID)..... -0-
FLOW RATE..... 15 SCFM, MAX
PRESSURE DROP TEST FLUID..... AIR
Cv (FLOW FACTOR)..... -0-
INTERNAL LEAKAGE..... .0003 SCCS SF6
EXTERNAL LEAKAGE..... ZERO APPARENT
MAXIMUM CONTAMINATE ALLOWED (MICRONS)..... 25.0000
VIBRATION LIMITS (GRMS)..... 6.90000
VIBRATION TIME (MIN/AXIS)..... -0-
SHOCK LIMITS (G's)..... 15.0000
REGULATION ACCURACY (%)..... 15.0000
WEIGHT (LBF)..... 0.55000
LIFETIME (YEARS)..... 15.0000
CYCLE LIFE (CYCLES)..... 100000.
MTBF (HOURS)..... -0-
LEAD TIME (WEEKS)..... 23
COMPATIBLE FLUIDS..... 20
ENVELOPE..... 3.4 IN X 3.9 IN X 1.75 IN
COMMENTS..... CYCLE LIFE IS ALSO MTBF

PRODUCTION COST..... -0-
DESIGN AND DEVELOPMENT COST..... -0-
STATE OF ART..... -0-
COMPLEXITY FACTOR..... -0-

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COMPONENT DATA SHEET 105

PRESSURE REGULATOR DATA REPORT / DATA ENTRY DATE: 05/14/87

TYPE.....	MECHANICAL
SUBTYPE (INLET OR OUTLET REGULATION).....	OUTLET
MANUFACTURER.....	021, FUTURECRAFT CORPORATION
MANUFACTURER'S PART NUMBER.....	400236 MODIFIED
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	QUALIFIED
PAST APPLICATIONS.....	TEAL RUBY SATELLITE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	2024-T351 ALUM&CRES
SEAL MATERIAL.....	EPM & FLUOROSILICONE
SEAT MATERIAL.....	-0-
UPPER INLET OPERATING PRESSURE (PSIA).....	3700.00
LOWER INLET OPERATING PRESSURE (PSIA).....	500.000
UPPER OUTLET OPERATING PRESSURE (PSIA).....	60.0000 MOD TO 50
LOWER OUTLET OPERATING PRESSURE (PSIA).....	60.0000 MOD TO 50
INLET PROOF PRESSURE (PSIG).....	5550.00
OUTLET PROOF PRESSURE (PSIG).....	3578.00
INLET BURST PRESSURE (PSIG).....	9540.00
OUTLET BURST PRESSURE (PSIG).....	9540.00
MAXIMUM OPERATING TEMPERATURE (F).....	160.000
MINIMUM OPERATING TEMPERATURE (F).....	-22.0000
THERMAL CYCLES (CYCLES).....	8.00000
CYCLE TEMPERATURES (RANGE, F).....	-29 TO 124
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.37500
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	0.0093 LBM/SEC
PRESSURE DROP TEST FLUID.....	GN2
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	1 SCCH
EXTERNAL LEAKAGE.....	1X10**-5 SCCS GN2
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	13.4000
VIBRATION TIME (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
REGULATION ACCURACY (%).....	6.70000
WEIGHT (LBF).....	1.80000
LIFETIME (YEARS).....	10.0000
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	26
COMPATIBLE FLUIDS.....	01
ENVELOPE.....	9.25 IN. X 2.63 IN. X 1.75 IN. (APPROX.)
COMMENTS.....	TUBE STUB FITTINGS

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

SENSOR DATA REPORT / DATA ENTRY DATE: 07/10/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	030, KULITE SEMICONDUCTOR PROD. INC
VENDOR PART NUMBER.....	BMDE-1100-10
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	QUALIFIED
PAST APPLICATIONS.....	-0-
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4PH & 15-5PH SS
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	10.0000
PROOF PRESSURE (PSIG).....	20.0000
BURST PRESSURE (PSIG).....	30.0000
MAXIMUM AMBIENT TEMPERATURE (F).....	250.000
MINIMUM AMBIENT TEMPERATURE (F).....	-40.0000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	20.0000
EXTERNAL LEAKAGE.....	0.0
UNITS FOR SENSING RANGE.....	PSID
UPPER LIMIT OF SENSING RANGE.....	10.0000
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	1.00000
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
OUTPUT SIGNAL.....	5 VDC
POWER REQUIREMENT.....	28 VDC
WEIGHT (LBF).....	0.37000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	4.2 IN X 1.0 IN DIA (APPROX)
COMMENTS.....	LAST DASH # = PRES, PORTS-MS33656-E4 7/16-20 UNF-3A

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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COMPONENT DATA SHEET

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SENSOR DATA REPORT / DATA ENTRY DATE: 06/04/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	082, MOOG CARLETON GROUP
VENDOR PART NUMBER.....	2731-0001-5
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	QUALIFIED
PAST APPLICATIONS.....	SPACE SHUTTLE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	-0-
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	20.0000
PROOF PRESSURE (PSIG).....	40.0000
BURST PRESSURE (PSIG).....	80.0000
MAXIMUM AMBIENT TEMPERATURE (F).....	120.000
MINIMUM AMBIENT TEMPERATURE (F).....	35.0000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
EXTERNAL LEAKAGE.....	0.2 SCCM
UNITS FOR SENSING RANGE.....	PSIA
UPPER LIMIT OF SENSING RANGE.....	20.0000
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
OUTPUT SIGNAL.....	0-5 VDC
POWER REQUIREMENT.....	24-32 VDC
WEIGHT (LBF).....	0.46000
LIFETIME (YEARS).....	10.0000
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	26
ENVELOPE.....	4.9 IN. X 1.25 IN. DIA. (APPROX)
COMMENTS.....	MS33649-4 FITTING. PRESSURES ARE PSIA

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

SENSOR DATA REPORT / DATA ENTRY DATE: 07/16/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	069, TELEDYNE TABER
VENDOR PART NUMBER.....	2403-200
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	INSAT, DELTA, TRIDENT, INTELSAT
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4 PH, 304 SS
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	200.000
PROOF PRESSURE (PSIG).....	800.000
BURST PRESSURE (PSIG).....	1200.00
MAXIMUM AMBIENT TEMPERATURE (F).....	250.000
MINIMUM AMBIENT TEMPERATURE (F).....	-100.000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	30.0000
EXTERNAL LEAKAGE.....	-0-
UNITS FOR SENSING RANGE.....	PSIA, PSIS OR PSIG
UPPER LIMIT OF SENSING RANGE.....	200.000
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	0.25000
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
OUTPUT SIGNAL.....	0-5 VDC
POWER REQUIREMENT.....	28 VDC +/- 8 VDC
WEIGHT (LBF).....	0.50000
LIFETIME (YEARS).....	20.0000
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	97000.0
LEAD TIME (WEEKS).....	14
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	2.65 IN X 1.5 IN DIA
COMMENTS.....	LAST DASH # = PRES, PORT-MS33649, PSIS- 14.7 PSIA REF, EMI FILT

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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SENSOR DATA REPORT / DATA ENTRY DATE: 07/06/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	011, IMO DELAVAL INC- CEC INSTR DIV
VENDOR PART NUMBER.....	615505
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	IN PROCESS
PAST APPLICATIONS.....	MILSTAR
PRINCIPAL MATERIAL OF CONSTRUCTION.....	17-4 & 15-5 SS, TI
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	400.000
PROOF PRESSURE (PSIG).....	790.000
BURST PRESSURE (PSIG).....	1320.00
MAXIMUM AMBIENT TEMPERATURE (F).....	250.000
MINIMUM AMBIENT TEMPERATURE (F).....	-65.0000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
VIBRATION LIMITS (GRMS).....	18.0000
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	1500.00
EXTERNAL LEAKAGE.....	-0-
UNITS FOR SENSING RANGE.....	PSIA
UPPER LIMIT OF SENSING RANGE.....	400.000
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	0.75000
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
OUTPUT SIGNAL.....	5 VDC
POWER REQUIREMENT.....	28 VDC
WEIGHT (LBF).....	0.43750
LIFETIME (YEARS).....	10.0000
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	.120000E7
LEAD TIME (WEEKS).....	48
COMPATIBLE FLUIDS.....	13, 16
ENVELOPE.....	5.5 IN X 1.25 IN DIA (APPROX)
COMMENTS.....	PSIG=PSIA, PORT=TUBE: 1.5 IN, COMPENSATED TEMP: -30 TO 160 F

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

SENSOR DATA REPORT / DATA ENTRY DATE: 08/06/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	024, STATHAM DIVISION, SOLARTRON
VENDOR PART NUMBER.....	CZ 9284/A
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	-0-
PRINCIPAL MATERIAL OF CONSTRUCTION.....	INOX, PHYNOX, NI, 17-4
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	3000.00
PROOF PRESSURE (PSIG).....	6000.00
BURST PRESSURE (PSIG).....	9000.00
MAXIMUM AMBIENT TEMPERATURE (F).....	250.000
MINIMUM AMBIENT TEMPERATURE (F).....	-65.0000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
EXTERNAL LEAKAGE.....	-0-
UNITS FOR SENSING RANGE.....	PSIA
UPPER LIMIT OF SENSING RANGE.....	3000.00
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	0.25000
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
OUTPUT SIGNAL.....	5 VDC
POWER REQUIREMENT.....	28 VOLT
WEIGHT (LBF).....	0.50688
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	3.31 IN X 1.26 IN DIA (APPROX)
COMMENTS.....	HIGH OUTPUT UNIT, EPDM CASE, PSIG = PSIA

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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SENSOR DATA REPORT / DATA ENTRY DATE: 07/02/87

TYPE.....	PRESSURE
SUBTYPE.....	STRAIN GAGE
VENDOR.....	014, EATON CONSOLIDATED CONTROLS
VENDOR PART NUMBER.....	41SG197-2000A1 MODIFIED
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	PEACEKEEPER/MX MISSILE SYS
PRINCIPAL MATERIAL OF CONSTRUCTION.....	STAINLESS STEEL
SEAL MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	2000.00 MOD TO 4000
PROOF PRESSURE (PSIG).....	3000.00 MOD TO 6000
BURST PRESSURE (PSIG).....	4000.00 MOD TO 8000
MAXIMUM AMBIENT TEMPERATURE (F).....	200.000
MINIMUM AMBIENT TEMPERATURE (F).....	-30.0000
MAXIMUM MEDIA TEMPERATURE (F).....	-0-
MINIMUM MEDIA TEMPERATURE (F).....	-0-
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-65, +250
VIBRATION LIMITS (GRMS).....	43.9000
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	8000.00
EXTERNAL LEAKAGE.....	-0-
UNITS FOR SENSING RANGE.....	PSIA
UPPER LIMIT OF SENSING RANGE.....	2000.00
LOWER LIMIT OF SENSING RANGE.....	0.00000
ACCURACY (% FULL SCALE).....	1.00000
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	-0-
OUTPUT SIGNAL.....	0-5 VDC
POWER REQUIREMENT.....	28 VDC +/- 4 VDC
WEIGHT (LBF).....	0.56250
LIFETIME (YEARS).....	10.0000
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	40000.0
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	08, 11
ENVELOPE.....	4.73 IN X 1.28 IN DIA (APPROX)
COMMENTS.....	PSIG=PSIA, PORT-MS33656E4, FILTER: 160HZ

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

COMPONENT DATA SHEET

133

VALVE DATA REPORT / DATA ENTRY DATE: 05/14/87

TYPE.....	CHECK
SUBTYPE.....	SERIES REDUNDANT
VENDOR.....	072, VACCO INDUSTRIES
VENDOR PART NUMBER.....	V1D10746-01
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	4 SAT. (HUGHES)
PRINCIPAL MATERIAL OF CONSTRUCTION.....	304L
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	TEFLON
OPERATING PRESSURE (PSIG).....	250.000
PROOF PRESSURE (PSIG).....	375.000
BURST PRESSURE (PSIG).....	1000.00
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	170.000
MINIMUM OPERATING TEMPERATURE (F).....	10.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	1.87 SCFM
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	-0-
EXTERNAL LEAKAGE.....	-0-
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	-0-
POWER REQUIREMENT.....	-0-
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	-0-
CLOSE RESPONSE TIME (MSEC).....	-0-
WEIGHT (LBF).....	0.50000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	04, 13, 16
ENVELOPE.....	L = 6.82 IN.; DIA. = 1.4 IN.
COMMENTS.....	TUBES IN & OUT; W/FILTER

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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VALVE DATA REPORT / DATA ENTRY DATE: 05/14/87

TYPE..... CHECK
SUBTYPE..... SERIES REDUNDANT
VENDOR..... 072, VACCO INDUSTRIES
VENDOR PART NUMBER..... 4573779
MARTIN MARIETTA PART NUMBER..... -0-
QUALIFICATION STATUS..... -0-
PAST APPLICATIONS..... 2 SAT. (HUGHES)
PRINCIPAL MATERIAL OF CONSTRUCTION..... 304L
SEAL MATERIAL..... -0-
SEAT MATERIAL..... TEFLON
OPERATING PRESSURE (PSIG)..... 400.000
PROOF PRESSURE (PSIG)..... 600.000
BURST PRESSURE (PSIG)..... 1200.00
CRACKING PRESSURE (PSID)..... -0-
RESEAT PRESSURE (PSID)..... -0-
CHECK PRESSURE (PSID)..... -0-
MAXIMUM OPERATING TEMPERATURE (F)..... 150.000
MINIMUM OPERATING TEMPERATURE (F)..... 30.0000
THERMAL CYCLES (CYCLES)..... -0-
CYCLE TEMPERATURES (RANGE,F)..... -0-
INLET PORT SIZE (IN)..... 0.25000
OUTLET PORT SIZE (IN)..... 0.25000
PRESSURE DROP (PSID)..... -0-
FLOW RATE..... 8.5 SCFM
PRESSURE DROP TEST FLUID..... GHE
Cv (FLOW FACTOR)..... -0-
INTERNAL LEAKAGE..... -0-
EXTERNAL LEAKAGE..... -0-
MAXIMUM CONTAMINATE ALLOWED (MICRONS)..... -0-
VIBRATION LIMITS (GRMS)..... -0-
VIBRATION DURATION (MIN/AXIS)..... -0-
SHOCK LIMITS (G's)..... -0-
METHOD OF ACTUATION..... -0-
POWER REQUIREMENT..... -0-
LATCHING MECHANISM..... -0-
NORMAL STATUS (OPEN OR CLOSED)..... -0-
OPEN RESPONSE TIME (MSEC)..... -0-
CLOSE RESPONSE TIME (MSEC)..... -0-
WEIGHT (LBF)..... 0.50000
LIFETIME (YEARS)..... -0-
CYCLE LIFE (CYCLES)..... -0-
MTBF (HOURS)..... -0-
LEAD TIME (WEEKS)..... -0-
COMPATIBLE FLUIDS..... 04
ENVELOPE..... L = 6.32 IN.; DIA. = 1.3 IN.
COMMENTS..... TUBES IN & OUT

PRODUCTION COST..... -0-
DESIGN AND DEVELOPMENT COST..... -0-
STATE OF ART..... -0-
COMPLEXITY FACTOR..... -0-

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VALVE DATA REPORT / DATA ENTRY DATE: 06/02/87

TYPE.....	CHECK
SUBTYPE.....	-0-
VENDOR.....	012, CIRCLE SEAL CONTROLS
VENDOR PART NUMBER.....	C277A-4Q
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	MISSILE PROGRAM
PRINCIPAL MATERIAL OF CONSTRUCTION.....	2024-T4
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	BUNA-N
OPERATING PRESSURE (PSIG).....	5000.00
PROOF PRESSURE (PSIG).....	-0-
BURST PRESSURE (PSIG).....	-0-
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	275.000
MINIMUM OPERATING TEMPERATURE (F).....	-65.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	-0-
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	-0-
EXTERNAL LEAKAGE.....	-0-
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	-0-
POWER REQUIREMENT.....	-0-
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	-0-
CLOSE RESPONSE TIME (MSEC).....	-0-
WEIGHT (LBF).....	-0-
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	-0-
ENVELOPE.....	-0-
COMMENTS.....	USED WITH HOT GAS, SPRING MAT: 302SS

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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VALVE DATA REPORT / DATA ENTRY DATE: 07/01/87

TYPE.....	CHECK
SUBTYPE.....	-0-
VENDOR.....	032, MAROTTA SCIENTIFIC CONTROLS
VENDOR PART NUMBER.....	806232
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	DELTA PROPULSION SYS
PRINCIPAL MATERIAL OF CONSTRUCTION.....	316 & 302 SST
SEAL MATERIAL.....	MIL-R-25897
SEAT MATERIAL.....	CTFE
OPERATING PRESSURE (PSIG).....	450.000
PROOF PRESSURE (PSIG).....	910.000
BURST PRESSURE (PSIG).....	1210.00
CRACKING PRESSURE (PSID).....	0.30000
RESEAT PRESSURE (PSID).....	0.02000
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	100.000
MINIMUM OPERATING TEMPERATURE (F).....	0.00000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.50000
OUTLET PORT SIZE (IN).....	0.50000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	400 SCFM
PRESSURE DROP TEST FLUID.....	N2 @ 400 PSI INLET, 60 F
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	3.0 SCC/HR FROM 0-450 PSIG
EXTERNAL LEAKAGE.....	ZERO FROM 0-910 PSIG
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	10.0000
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	-0-
POWER REQUIREMENT.....	-0-
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	-0-
CLOSE RESPONSE TIME (MSEC).....	-0-
WEIGHT (LBF).....	0.20000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	14
COMPATIBLE FLUIDS.....	03, 06
ENVELOPE.....	2.314 IN X 1.00 IN DIA (APPROX)
COMMENTS.....	FITTINGS-MS33656E8, MODEL CVM508E-1A, EQ DIA=0.316 IN, CD=0.6

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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VALVE DATA REPORT / DATA ENTRY DATE: 04/14/87

TYPE.....	SOLENOID
SUBTYPE.....	DOUBLE ACTING, LATCH
VENDOR.....	075, WRIGHT COMPONENTS, INC.
VENDOR PART NUMBER.....	15983-1
MARTIN MARIETTA PART NUMBER.....	N/A
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	GRO
PRINCIPAL MATERIAL OF CONSTRUCTION.....	CRES
SEAL MATERIAL.....	NITRILE
SEAT MATERIAL.....	VITON
OPERATING PRESSURE (PSIG).....	20.0000
PROOF PRESSURE (PSIG).....	1560.00
BURST PRESSURE (PSIG).....	7600.00
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	95.0000
MINIMUM OPERATING TEMPERATURE (F).....	-60.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	EQ. DIA. = 0.055 IN.
PRESSURE DROP TEST FLUID.....	DISCHARGE COEFF. = 0.70
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	1 X 10**-4SCCS GHE@20-3000PSIA
EXTERNAL LEAKAGE.....	1 X 10**-6SCCS GHE@20-3000PSIA
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	SOLENOID
POWER REQUIREMENT.....	21-35 VDC
LATCHING MECHANISM.....	DETENT
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	30.0000
CLOSE RESPONSE TIME (MSEC).....	30.0000
WEIGHT (LBF).....	1.50000
LIFETIME (YEARS).....	5.00000
CYCLE LIFE (CYCLES).....	10000.0
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	01, 04
ENVELOPE.....	2.53 IN. X 1.187 IN. X 1.68 IN. (APPROX)
COMMENTS.....	ALSO COMPATIBLE WITH GASEOUS NEON, ARGON, & ETHANE

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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VALVE DATA REPORT / DATA ENTRY DATE: 04/14/87

TYPE.....	SOLENOID
SUBTYPE.....	LATCHING
VENDOR.....	075, WRIGHT COMPONENTS, INC.
VENDOR PART NUMBER.....	15613
MARTIN MARIETTA PART NUMBER.....	N/A
QUALIFICATION STATUS.....	N/A
PAST APPLICATIONS.....	SPACE SHUTTLE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	316 CRES
SEAL MATERIAL.....	VARIOUS
SEAT MATERIAL.....	EPR 515-8
OPERATING PRESSURE (PSIG).....	75.0000
PROOF PRESSURE (PSIG).....	115.000
BURST PRESSURE (PSIG).....	150.000
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	212.000
MINIMUM OPERATING TEMPERATURE (F).....	35.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	0.20000
FLOW RATE.....	5.8 LBM/HOUR
PRESSURE DROP TEST FLUID.....	WATER @ 20 PSIA
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	5 SCCH HE @ 20-115 PSIG
EXTERNAL LEAKAGE.....	ZERO
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	SOLENOID
POWER REQUIREMENT.....	22-30 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	100.000
CLOSE RESPONSE TIME (MSEC).....	100.000
WEIGHT (LBF).....	1.41000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	1000.00
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	26
ENVELOPE.....	4.54 IN. X 2.95 IN. X 1.80 IN. (APPROX.)
COMMENTS.....	OPERATING PRESSURE IS 75 PSIA

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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VALVE DATA REPORT / DATA ENTRY DATE: 04/14/87

TYPE..... SOLENOID
SUBTYPE..... -0-
VENDOR..... 075, WRIGHT COMPONENTS, INC.
VENDOR PART NUMBER..... 13611-2
MARTIN MARIETTA PART NUMBER..... N/A
QUALIFICATION STATUS..... N/A
PAST APPLICATIONS..... SPACE SHUTTLE
PRINCIPAL MATERIAL OF CONSTRUCTION..... 430/316 CRES
SEAL MATERIAL..... ETHYLENE PROPYLENE
SEAT MATERIAL..... TEFLON
OPERATING PRESSURE (PSIG)..... 75.0000
PROOF PRESSURE (PSIG)..... 150.000
BURST PRESSURE (PSIG)..... 225.000
CRACKING PRESSURE (PSID)..... -0-
RESEAT PRESSURE (PSID)..... -0-
CHECK PRESSURE (PSID)..... -0-
MAXIMUM OPERATING TEMPERATURE (F)..... 212.000
MINIMUM OPERATING TEMPERATURE (F)..... 35.0000
THERMAL CYCLES (CYCLES)..... -0-
CYCLE TEMPERATURES (RANGE, F)..... -0-
INLET PORT SIZE (IN)..... 0.25000
OUTLET PORT SIZE (IN)..... 0.25000
PRESSURE DROP (PSID)..... -0-
FLOW RATE..... EQ. DIA. = 0.125 IN.
PRESSURE DROP TEST FLUID..... DISCHARGE COEFF. = 0.65
Cv (FLOW FACTOR)..... -0-
INTERNAL LEAKAGE..... 5 SCCH HE MAX
EXTERNAL LEAKAGE..... ZERO
MAXIMUM CONTAMINATE ALLOWED (MICRONS)..... -0-
VIBRATION LIMITS (GRMS)..... -0-
VIBRATION DURATION (MIN/AXIS)..... -0-
SHOCK LIMITS (G's)..... -0-
METHOD OF ACTUATION..... SOLENOID
POWER REQUIREMENT..... 22-30 VDC
LATCHING MECHANISM..... -0-
NORMAL STATUS (OPEN OR CLOSED)..... CLOSED
OPEN RESPONSE TIME (MSEC)..... 20.0000
CLOSE RESPONSE TIME (MSEC)..... 20.0000
WEIGHT (LBF)..... 0.50000
LIFETIME (YEARS)..... -0-
CYCLE LIFE (CYCLES)..... 20000.0
MTBF (HOURS)..... -0-
LEAD TIME (WEEKS)..... -0-
COMPATIBLE FLUIDS..... 07
ENVELOPE..... 3.10 IN. X 2.125 IN. X 1.25 IN.
COMMENTS..... OPERATING PRESSURE IS 75 PSIA

PRODUCTION COST..... -0-
DESIGN AND DEVELOPMENT COST..... -0-
STATE OF ART..... -0-
COMPLEXITY FACTOR..... -0-

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COMPONENT DATA SHEET 143

VALVE DATA REPORT / DATA ENTRY DATE: 06/02/87

TYPE.....	SOLENOID
SUBTYPE.....	LATCHING
VENDOR.....	035, MOOG SPACE PRODUCTS DIVISION
VENDOR PART NUMBER.....	53-159
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	HUGHES, BAE, ERNO, QUAL. PROGRAMS
PRINCIPAL MATERIAL OF CONSTRUCTION.....	CRES 300
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	300.000
PROOF PRESSURE (PSIG).....	-0-
BURST PRESSURE (PSIG).....	-0-
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	140.000
MINIMUM OPERATING TEMPERATURE (F).....	-30.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	5.00000
FLOW RATE.....	0.5 LB/SEC
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	1.8 SCC/HR H2 @ 300 PSI
EXTERNAL LEAKAGE.....	.018 SCC/HR N2 @ 300 PSI
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	20.0000
METHOD OF ACTUATION.....	-0-
POWER REQUIREMENT.....	13 WATTS 15.3 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	-0-
CLOSE RESPONSE TIME (MSEC).....	-0-
WEIGHT (LBF).....	0.50000
LIFETIME (YEARS).....	10.0000
CYCLE LIFE (CYCLES).....	30000.0
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	15, 21, 01, 04, 26
ENVELOPE.....	1.4 IN. X 4.8 IN. X 3.94 IN.
COMMENTS.....	-0-

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

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COMPONENT DATA SHEET 145

VALVE DATA REPORT / DATA ENTRY DATE: 04/28/87

TYPE.....	SOLENOID
SUBTYPE.....	NORMALLY CLOSED
VENDOR.....	004, AMETEK, STRAZA DIVISION
VENDOR PART NUMBER.....	435
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	COMPLETE
PAST APPLICATIONS.....	SATURN II
PRINCIPAL MATERIAL OF CONSTRUCTION.....	2024-T4 ALUM & CRES
SEAL MATERIAL.....	BUNA "N"
SEAT MATERIAL.....	18-8/303 CRES
OPERATING PRESSURE (PSIG).....	3000.00
PROOF PRESSURE (PSIG).....	4500.00
BURST PRESSURE (PSIG).....	7500.00
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	165.000
MINIMUM OPERATING TEMPERATURE (F).....	-65.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.25000
OUTLET PORT SIZE (IN).....	0.25000
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	EQ. DIA. = 0.100 IN.
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	0.05 SCIM @ 70F & 0-3000 PSI
EXTERNAL LEAKAGE.....	ZERO
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	15.0000
METHOD OF ACTUATION.....	SOLENOID
POWER REQUIREMENT.....	18-32 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	CLOSED
OPEN RESPONSE TIME (MSEC).....	30.0000
CLOSE RESPONSE TIME (MSEC).....	50.0000
WEIGHT (LBF).....	1.50000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	1800.00
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	42
COMPATIBLE FLUIDS.....	01
ENVELOPE.....	5.5 IN. X 1.906 IN. X 2.312 IN.
COMMENTS.....	-0-

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

COMPONENT DATA SHEET

146

VALVE DATA REPORT / DATA ENTRY DATE: 04/14/87

TYPE.....	SOLENOID
SUBTYPE.....	-0-
VENDOR.....	075, WRIGHT COMPONENTS, INC.
VENDOR PART NUMBER.....	15751
MARTIN MARIETTA PART NUMBER.....	N/A
QUALIFICATION STATUS.....	QUALIFIED
PAST APPLICATIONS.....	SATELLITE
PRINCIPAL MATERIAL OF CONSTRUCTION.....	CRES
SEAL MATERIAL.....	FLUOROSILICONE/METAL
SEAT MATERIAL.....	FLUOROSILICONE
OPERATING PRESSURE (PSIG).....	75.0000
PROOF PRESSURE (PSIG).....	200.000
BURST PRESSURE (PSIG).....	250.000
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	150.000
MINIMUM OPERATING TEMPERATURE (F).....	-80.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE, F).....	-0-
INLET PORT SIZE (IN).....	0.37500
OUTLET PORT SIZE (IN).....	0.37500
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	-0-
PRESSURE DROP TEST FLUID.....	-0-
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	2 SCCH HE MAX
EXTERNAL LEAKAGE.....	2 SCCH HE MAX
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	SOLENOID
POWER REQUIREMENT.....	28 +1/-4 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	CLOSED
OPEN RESPONSE TIME (MSEC).....	20.0000
CLOSE RESPONSE TIME (MSEC).....	20.0000
WEIGHT (LBF).....	0.60000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	500000.
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	01, 04
ENVELOPE.....	2.8 IN. X 2.0 IN. X 1.8 IN. (APPROX.)
COMMENTS.....	LOW LEVEL THRUST VALVE - 0.05 LBF

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PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

VALVE DATA REPORT / DATA ENTRY DATE: 06/03/87

TYPE.....	TORQUE MOTOR
SUBTYPE.....	LATCHING
VENDOR.....	035, MOOG SPACE PRODUCTS DIVISION
VENDOR PART NUMBER.....	52-178
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	YES
PAST APPLICATIONS.....	LEASAT
PRINCIPAL MATERIAL OF CONSTRUCTION.....	-0-
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	-0-
OPERATING PRESSURE (PSIG).....	400.000
PROOF PRESSURE (PSIG).....	600.000
BURST PRESSURE (PSIG).....	1600.00
CRACKING PRESSURE (PSID).....	200.000
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	170.000
MINIMUM OPERATING TEMPERATURE (F).....	10.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.37500
OUTLET PORT SIZE (IN).....	0.37500
PRESSURE DROP (PSID).....	1.00000
FLOW RATE.....	0.04 LB/SEC
PRESSURE DROP TEST FLUID.....	WATER
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	50/5 SCC/HR GN2 @ 25/225 PSIG
EXTERNAL LEAKAGE.....	1.0E-6 SCC/SEC GHE @ 400 PSIG
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	17.6000
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	-0-
POWER REQUIREMENT.....	27 WATTS 27 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	50.0000
CLOSE RESPONSE TIME (MSEC).....	50.0000
WEIGHT (LBF).....	1.70000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	1000.00
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	15
ENVELOPE.....	4.8 IN. X 6.0 IN. X 1.7 IN. (APPROX.)
COMMENTS.....	MONOPROPELLANT

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

COMPONENT DATA SHEET

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VALVE DATA REPORT / DATA ENTRY DATE: 04/14/87

TYPE.....	SOLENOID
SUBTYPE.....	-0-
VENDOR.....	075, WRIGHT COMPONENTS, INC.
VENDOR PART NUMBER.....	15975
MARTIN MARIETTA PART NUMBER.....	N/A
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	-0-
PRINCIPAL MATERIAL OF CONSTRUCTION.....	-0-
SEAL MATERIAL.....	-0-
SEAT MATERIAL.....	AF-E-411
OPERATING PRESSURE (PSIG).....	450.000
PROOF PRESSURE (PSIG).....	920.000
BURST PRESSURE (PSIG).....	1820.00
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	170.000
MINIMUM OPERATING TEMPERATURE (F).....	40.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.50000
OUTLET PORT SIZE (IN).....	-0-
PRESSURE DROP (PSID).....	60.0000
FLOW RATE.....	0.80 LBM/SEC
PRESSURE DROP TEST FLUID.....	HYDRAZINE @ 70F
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	3 SCCH GN2 @ 70 - 450 PSIA
EXTERNAL LEAKAGE.....	1 X 10**-6 SCCS GHE @ 450 PSIG
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	SOLENOID
POWER REQUIREMENT.....	21-35 VDC
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	CLOSED
OPEN RESPONSE TIME (MSEC).....	12.0000
CLOSE RESPONSE TIME (MSEC).....	12.0000
WEIGHT (LBF).....	1.50000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	100000.
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	15, 01, 04, 26, 21
ENVELOPE.....	-0-
COMMENTS.....	-0-

PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-

VALVE DATA REPORT / DATA ENTRY DATE: 04/29/87

TYPE..... SOLENOID
SUBTYPE..... PILOT OPERATED
VENDOR..... 004, AMETEK, STRAZA DIVISION
VENDOR PART NUMBER..... 525-503
MARTIN MARIETTA PART NUMBER..... PD47S0153
QUALIFICATION STATUS..... COMPLETE
PAST APPLICATIONS..... TITAN III
PRINCIPAL MATERIAL OF CONSTRUCTION..... 17-4PH CRES
SEAL MATERIAL..... -0-
SEAT MATERIAL..... -0-
OPERATING PRESSURE (PSIG)..... 3700.00
PROOF PRESSURE (PSIG)..... 5550.00
BURST PRESSURE (PSIG)..... 9250.00
CRACKING PRESSURE (PSID)..... -0-
RESEAT PRESSURE (PSID)..... -0-
CHECK PRESSURE (PSID)..... -0-
MAXIMUM OPERATING TEMPERATURE (F)..... 160.000
MINIMUM OPERATING TEMPERATURE (F)..... -120.000
THERMAL CYCLES (CYCLES)..... -0-
CYCLE TEMPERATURES (RANGE,F)..... -0-
INLET PORT SIZE (IN)..... 1.00000
OUTLET PORT SIZE (IN)..... 1.00000
PRESSURE DROP (PSID)..... -0-
FLOW RATE..... 0.285 LBM/SEC
PRESSURE DROP TEST FLUID..... GHE @ 3600 PSIA & 75F
Cv (FLOW FACTOR)..... -0-
INTERNAL LEAKAGE..... 16.6 SCCM MAX
EXTERNAL LEAKAGE..... 10 SCCM MAX
MAXIMUM CONTAMINATE ALLOWED (MICRONS)..... -0-
VIBRATION LIMITS (GRMS)..... -0-
VIBRATION DURATION (MIN/AXIS)..... -0-
SHOCK LIMITS (G's)..... -0-
METHOD OF ACTUATION..... SOLENOID
POWER REQUIREMENT..... 25 VDC
LATCHING MECHANISM..... -0-
NORMAL STATUS (OPEN OR CLOSED)..... -0-
OPEN RESPONSE TIME (MSEC)..... 27.0000
CLOSE RESPONSE TIME (MSEC)..... 40.0000
WEIGHT (LBF)..... 2.20000
LIFETIME (YEARS)..... -0-
CYCLE LIFE (CYCLES)..... 50000.0
MTBF (HOURS)..... -0-
LEAD TIME (WEEKS)..... 42
COMPATIBLE FLUIDS..... 04
ENVELOPE..... 4.00 IN. X 4.00 IN. X 2.687 IN. (APPROX)
COMMENTS..... -0-

PRODUCTION COST..... -0-
DESIGN AND DEVELOPMENT COST..... -0-
STATE OF ART..... -0-
COMPLEXITY FACTOR..... -0-

VALVE DATA REPORT / DATA ENTRY DATE: 05/12/87

TYPE.....	MANUAL
SUBTYPE.....	SERVICE
VENDOR.....	072, VACCO INDUSTRIES
VENDOR PART NUMBER.....	V1E10330-01
MARTIN MARIETTA PART NUMBER.....	-0-
QUALIFICATION STATUS.....	-0-
PAST APPLICATIONS.....	G.E.
PRINCIPAL MATERIAL OF CONSTRUCTION.....	TITANIUM
SEAL MATERIAL.....	ETHYLENE PROPYLENE
SEAT MATERIAL.....	TUNGSTEN & 17-4 PH
OPERATING PRESSURE (PSIG).....	4500.00
PROOF PRESSURE (PSIG).....	6750.00
BURST PRESSURE (PSIG).....	18000.0
CRACKING PRESSURE (PSID).....	-0-
RESEAT PRESSURE (PSID).....	-0-
CHECK PRESSURE (PSID).....	-0-
MAXIMUM OPERATING TEMPERATURE (F).....	140.000
MINIMUM OPERATING TEMPERATURE (F).....	-40.0000
THERMAL CYCLES (CYCLES).....	-0-
CYCLE TEMPERATURES (RANGE,F).....	-0-
INLET PORT SIZE (IN).....	0.50000
OUTLET PORT SIZE (IN).....	0.37500
PRESSURE DROP (PSID).....	-0-
FLOW RATE.....	0.3 PPS
PRESSURE DROP TEST FLUID.....	H2O
Cv (FLOW FACTOR).....	-0-
INTERNAL LEAKAGE.....	-0-
EXTERNAL LEAKAGE.....	-0-
MAXIMUM CONTAMINATE ALLOWED (MICRONS).....	-0-
VIBRATION LIMITS (GRMS).....	-0-
VIBRATION DURATION (MIN/AXIS).....	-0-
SHOCK LIMITS (G's).....	-0-
METHOD OF ACTUATION.....	MANUAL
POWER REQUIREMENT.....	-0-
LATCHING MECHANISM.....	-0-
NORMAL STATUS (OPEN OR CLOSED).....	-0-
OPEN RESPONSE TIME (MSEC).....	-0-
CLOSE RESPONSE TIME (MSEC).....	-0-
WEIGHT (LBF).....	2.00000
LIFETIME (YEARS).....	-0-
CYCLE LIFE (CYCLES).....	-0-
MTBF (HOURS).....	-0-
LEAD TIME (WEEKS).....	-0-
COMPATIBLE FLUIDS.....	01,04,21,26,35
ENVELOPE.....	L = 5.65 IN.; DIA. = 2.0 IN.
COMMENTS.....	TUBE OUT; MS33656-8 IN.

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PRODUCTION COST.....	-0-
DESIGN AND DEVELOPMENT COST.....	-0-
STATE OF ART.....	-0-
COMPLEXITY FACTOR.....	-0-